PROPOSED
SAFE HARBOR AGREEMENT

FOR THE CHIRICAHUA LEOPARD FROG IN THE MALPAI BORDERLANDS OF ARIZONA AND NEW MEXICO

Between the Malpai Borderlands Group and
U.S. Fish and Wildlife Service

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1.0 Introduction and Background

1.1 Purpose and Need

The purpose of this Safe Harbor Agreement (Agreement) is threefold: 1) to establish a program for the conservation of the Chiricahua leopard frog (*Rana chiricahuensis*), a species listed as Threatened under the Federal Endangered Species Act (Act) of 1973, as amended, on private and other non-Federal lands in the Malpai Borderlands area of Arizona and New Mexico; 2) to provide regulatory assurances to landowners in the Malpai area who voluntarily participate in this program that their conservation efforts will not result in significant new land use restrictions that might otherwise apply due to the listing of Chiricahua leopard frog under the Act; and 3) to provide similar assurances to Malpai landowners who do not directly participate in the conservation program established under this Agreement, but may desire regulatory assurances due to their proximity to program participants, or other lands harboring Chiricahua leopard frogs.

This Agreement is needed to provide incentives through regulatory assurances for non-Federal Malpai area landowners to undertake voluntary conservation measures for the Chiricahua leopard frog on their lands. As of the effective date of the Agreement, such measures are currently not required by the Act and are therefore entirely voluntary. In return, the U.S. Fish and Wildlife Service (Service) has indicated its willingness to utilize a new program under the Act, the Safe Harbor Agreement program, to ensure that such measures will not result in new, unpredictable, or prohibitive regulatory restrictions on the use of Malpai lands beyond what is established in the Agreement. Such assurances will be provided by the Agreement and an associated enhancement of survival permit issued to the Malpai Borderlands Group (Malpai) pursuant to section 10(a)(1)(A) of the Act. Program participants will be provided assurances through Certificates of Inclusion to the Malpai's permit.

In its final rule to list the Chiricahua leopard frog under the Act, the Service included a rule under section 4(d) of the Act that authorizes take of Chiricahua leopard frogs as a result of livestock use of or maintenance activities at livestock tanks located on private, State, or tribal lands (67 *Federal Register* 40790). Rules under section 4(d) only apply to Threatened species. In the event that the Chiricahua leopard frog is reclassified to Endangered under the Act, the section 10(a)(1)(A) permit that would be issued in association with this Agreement would provide continued assurances or coverage of the activities covered under the current section 4(d) rule for the Malpai, Participating Landowner, Participating Neighbor, or Participating State Agency on private and other non-Federal lands enrolled in this Agreement.

1.2 Regulatory Basis and Agreement Structure

The regulatory basis for this Agreement is contained in written policies prepared by the Service for the Safe Harbor Agreement program (64 *Federal Register* 32717), and in federal regulations promulgated to codify both programs' permits authorities (64 *Federal Register* 32706). The Agreement establishes an uninterrupted conservation and regulatory program that will run until such time as the Agreement is terminated by the Malpai Borderlands Group or the Service acting either jointly or unilaterally.

The document is divided into five principal sections. Section 1 presents information on the area covered by the Agreement, affected landowners in the Malpai area, and Chiricahua leopard frog biology and conservation concerns. Section 2 describes the Safe Harbor Agreement program and contains those measures necessary to meet Service requirements for Safe Harbor Agreements. Section 3 describes

various administrative procedures that apply to the Agreement, and Section 4 lists scientific and other literature cited throughout the document. Lastly, the Appendices section contains a number of forms and protocols and background information.

1.3 Background

1.3.1 The Malpai Borderlands Group

The applicant under this Agreement is the Malpai Borderlands Group, a private, non-profit organization composed of ranchers who live in the Malpai Borderlands area. The Malpai is dedicated to sustaining traditional ranching economies in the Malpai region, as well as maintaining its rich biodiversity and open space values. Further, the Malpai believes that developing strategic alliances between the public and private sectors and between ranching, conservation, and scientific communities is the best way of achieving these important goals. The Malpai has undertaken a number of conservation actions since its inception in 1994, including a prescribed burn program, a grass banking program, and programs to protect and improve habitat conditions for a number of rare wildlife and plant species. This joint Agreement to conserve the Chiricahua leopard frog in the Malpai region is consistent with Malpai's objectives. The Malpai, together with the Service, will serve as the Administrator of this Agreement. The Malpai will hold the Agreement's associated section 10(a)(1)(A) permit on behalf of individual participating landowners as described in section 2.0 of the Agreement.

1.3.2 Description of the Covered Area and Ownership

The area covered by this Agreement and its associated section 10(a)(1)(A) permit, termed the "covered area", encompasses approximately 1 million acres (404,700 hectares) of ranch lands in Cochise County, Arizona and Hidalgo County, New Mexico known as the Malpai Borderlands. The area encompasses two distinct geomorphic regions: 1) the lower San Bernardino Valley/southern Peloncillo Mountains area on the west side of the covered area (in Arizona); and 2) the Animas Valley/Animas Mountains area on the east side of the covered area (in New Mexico). Each of these areas is considered to contain a distinct Chiricahua leopard frog metapopulation (section 2.5.1).

On the San Bernardino Valley/Peloncillo Mountains side of the covered area, land ownership consists of a combination of private, State, and Federal landowners. Principal public land management agencies are the Arizona State Land Department, the U.S. Forest Service (Coronado National Forest)(USFS), the U.S. Bureau of Land Management (BLM), and the U.S. Fish and Wildlife Service / San Bernardino National Wildlife Refuge (Refuge). Malpai ranchers on this side of the covered area operate their grazing programs on their own lands and through grazing allotments or leases on State or Federal lands. The Animas Valley/Animas Mountains side of the covered area is comprised primarily of the 321,000-acre Gray Ranch. Gray Ranch is owned by the non-profit Animas Foundation, which operates the ranch for livestock grazing as well as conservation and scientific purposes. Land ownership in the covered area is approximately 59% private, 24% State, and 17% Federal. Overall, the covered area consists of about 30 separate ranches, of which about twenty are currently involved in Malpai programs.

The covered area under this Agreement is shown in Map 1. Only non-Federal landowners whose lands lie within this covered area, termed "Malpai landowners", have the option to participate in the Agreement's conservation program and to be covered by its associated permit. This includes all private landowners within the covered area, as well as State agencies who administer lands in the area and on which private Malpai landowners hold grazing allotments (section 3.1). However, Malpai contemplates that other landowners adjacent to the covered area may wish or elect to participate in a similar program

for their lands. If another safe harbor agreement, and associated permit, is not available to these landowners, they may receive assurances under this Agreement as Participating Neighbors (section 2.6).

A similar statewide Safe Harbor Agreement and associated enhancement of survival section 10(a)(1)(A) permit is being pursued by Arizona Game and Fish Department (AGFD), which will overlap the covered area of this Agreement. It is anticipated that AGFD will be a cooperating agency participating in this Agreement and will give deference to this Agreement within its covered area. Outside this Agreement's covered area, within Arizona, Malpai will give deference to AGFD's statewide agreement. Landowners within Arizona, which have lands both inside and outside the Malpai covered area, will be able to choose whether to participate in the Malpai Agreement or the AGFD Agreement where such participation is desired. A similar arrangement in New Mexico could occur if New Mexico Department of Game and Fish (NMDGF) pursues development of a Safe Harbor Agreement for this species. Currently, landowners in this situation in New Mexico that have lands both inside and outside the covered area will be considered Malpai for the purpose of participation in this Agreement where such participation is desired. In addition, any Malpai landowner may participate in the program whether or not that landowner is a participant in other Malpai programs.

1.3.3. Covered Species

This joint Agreement covers only the Chiricahua leopard frog.

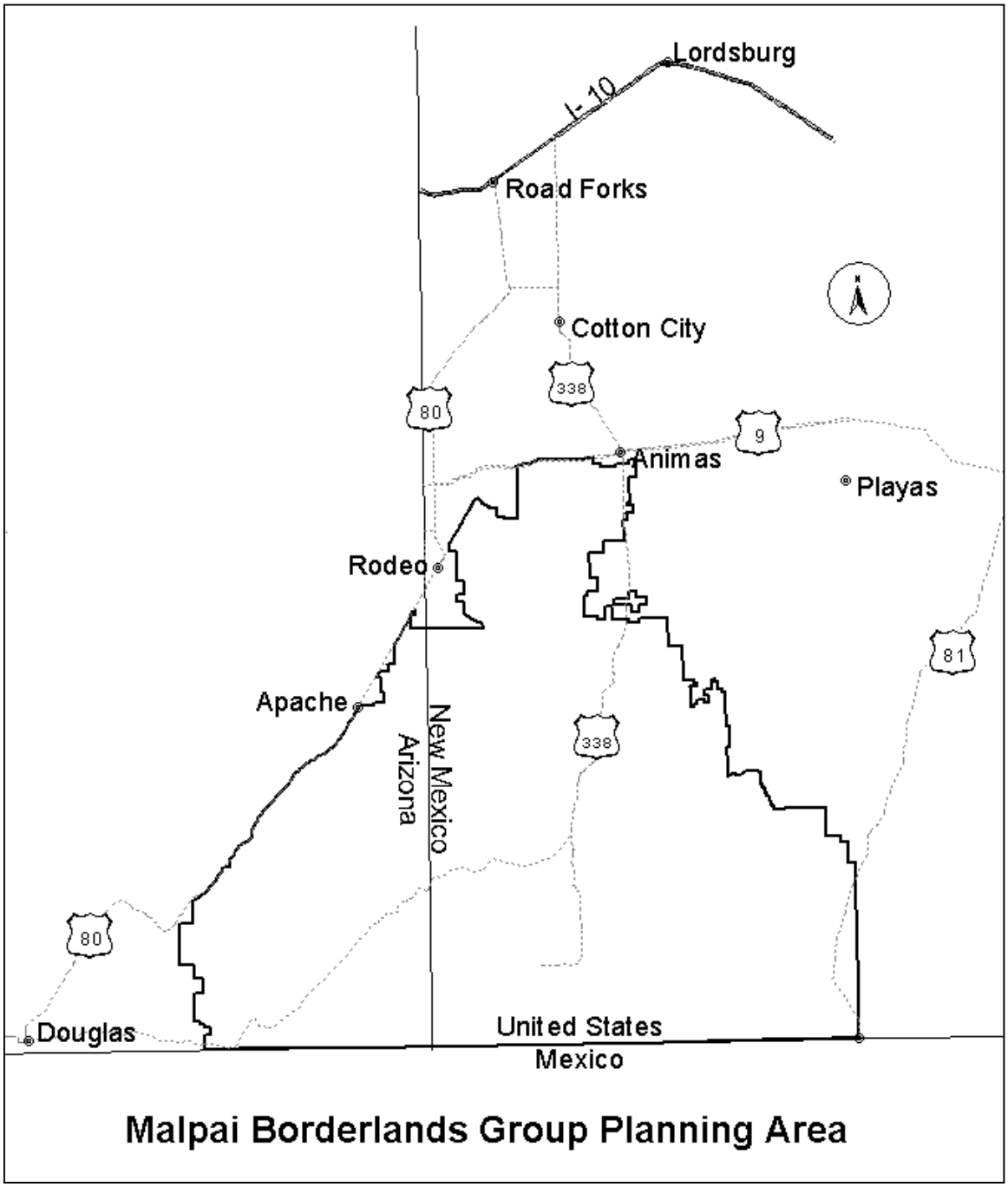
1.3.4 Biology and Distribution of the Chiricahua Leopard Frog

Except where otherwise indicated, the following information is adopted from the Service's June 14 2002, final rule listing the Chiricahua leopard frog as a threatened species (67 FR 40790).

The Chiricahua leopard frog inhabits cienegas (mid-elevation wetland communities often surrounded by arid environments), pools, livestock tanks, lakes, reservoirs, streams, and rivers at elevations of 1,000 to 2,710 meters (3,281 to 8,890 feet) in central and southeastern Arizona; west-central and southwestern New Mexico; northern Sonora, Mexico; and the Sierra Madre Occidental of Chihuahua, Mexico. The range of the species is divided into two parts: 1) a southern group of populations located in mountains and valleys south of the Gila River in southeastern Arizona, southwestern New Mexico, and Mexico (which includes the area covered in this Agreement); and, 2) northern montane populations in west central New Mexico and in the White Mountains along the Mogollon Rim in central and eastern Arizona.

The Chiricahua leopard frog has experienced significant declines in numbers and distribution within its former range and is now absent from many historical localities and previously occupied mountain ranges, valleys, and drainages. In areas where it is still present, populations are often few, small, and widely scattered. Chiricahua leopard frogs were historically reported at 231 localities in Arizona and 182 localities in New Mexico. However, from 1995 to the present, leopard frogs have been reported from only 87 sites in Arizona (21 northern localities and 66 southern localities) and 41 sites in New Mexico (33 northern localities and 8 southern localities) (67 FR 40790). These survey data suggest that Chiricahua leopard frogs are now absent from 62% and 78% of historical sites in Arizona and New Mexico, respectively. Extant localities are generally limited to stream and river drainages, headwaters, springs, and stock tanks.

Map 1. Location of the area covered by the Malpai Borderlands Group Chiricahua frog Safe Harbor Agreement.



Chiricahua leopard frogs are threatened by a number of factors, including: 1) habitat alteration, destruction, and fragmentation resulting from water diversions, groundwater pumping, dams, introduction of non-natives, woodcutting, mining, contaminants, urban/agricultural development, road construction, overgrazing, altered fire regimes, and other factors; 2) disease, including chytridiomycosis; 3) loss of metapopulation structure, 4) drought, and 5) predation by non-native aquatic organisms, including bullfrogs (*Rana catesbeiana*), crayfish (*Oronectes virilis*), tiger salamanders (*Ambystoma tigrinum mavortium* and *A.t. nebulosum*), and fish in the families Centrarchidae, Ictaluridae, and Salmonidae. Pollution of leopard frog habitats by water- and air-borne contaminants may be additional factors threatening the species, although the effects of such contaminants are poorly understood. Potential sources of airborne pollutants include smelter operations and potential sources of water-borne contaminants include mining and grazing.

Invasion of Chiricahua leopard frog habitats by non-native aquatic predators is a major factor threatening remaining Chiricahua leopard frog populations. For example, Rosen *et al.* (1995, 1996) found that 16 of 19 historical localities where leopard frogs still occurred lacked non-native aquatic predators, while all surveyed historical localities that lacked Chiricahua leopard frogs supported non-native predators. This is a central issue addressed by the Agreement's conservation program.

Livestock grazing occurs throughout the range of the Chiricahua leopard frog and stock tanks constructed as water sources for livestock are critically important leopard frog habitats. In some areas (e.g., the San Rafael Valley, San Bernardino Valley, Fossil Creek drainage, and Patagonia Mountains of Arizona) stock tanks have largely replaced the species' natural habitats and may provide the only remaining suitable habitat. While the effects of livestock grazing on leopard frogs are not well studied, maintenance of viable leopard frog populations is thought to be compatible with well-managed livestock grazing (65 FR 37343). Furthermore, Rosen (1999) states that management of stock tank habitats is relatively "tractable" compared to more natural environments, (i.e., water regimes and the presence of non-native predators are more easily controlled). Consequently, management of stock tanks for the benefit of Chiricahua leopard frogs is also a central issue addressed by this Agreement.

1.4 Description of Existing Conditions

The Chiricahua leopard frog is likely limited to 42 or fewer localities in the southern portion of its range (USFWS files). Approximately 12 known, reproducing leopard frog populations occur within the Agreement's covered area. These include population sites on USFS lands (Coronado National Forest), on State lands utilized by a Malpai landowner under a State grazing allotment, and the majority occur on private ranch lands within the Malpai covered area (Rosen 1999). Of these 12 sites, one occurs in natural spring or stream habitat, one site on the Refuge is an artificially constructed fenced enclosure, and at least nine occur in stock tanks. In addition, a number of stock tanks on Malpai lands are known to support leopard frog populations in years with relatively high rainfall (Rosen, pers. comm.), and other currently unoccupied tanks have the potential to support additional leopard frog populations (Rosen 1999). These data indicate the actual and potential importance of ranch lands, and particularly stock tanks, to leopard frogs in the Malpai area.

A number of aquatic sites within the Malpai covered area are also known to support significant populations of bullfrogs and other non-native species; including Black Draw on the Refuge, the leopard frog enclosure on the Refuge – which has been invaded by bullfrogs despite a "frog-proof" fence (Bill Radke, Refuge Manager, pers. comm.), the cienega at Gray Ranch headquarters, and possibly other locations. These data indicate the potentially precarious nature of Chiricahua leopard frog populations in the Malpai area with respect to bullfrog competition, and the challenge of managing for one frog species and against another in the same vicinity.

Nevertheless, management of Chiricahua leopard frog populations within the Malpai covered area represents a potentially important component in conservation of this species (Rosen 1999). Furthermore, a number of Malpai landowners have expressed a willingness to accept the presence of Chiricahua leopard frogs on their lands, provided their economic interests can be reasonably protected. Indeed, in one well-publicized case, the Magoffin Ranch maintained a small leopard frog population in one of its stock tanks, by hauling 1,000 gallons of water per week to the tank for approximately 24 months during a drought from June 1994 until summer of 1996. It was this population from which leopard frog tadpoles were provided to establish the populations now present in the Refuge enclosure. They were also used in the Douglas High School captive propagation facility, which is not currently in operation.

2.0 Safe Harbor Agreement

This Agreement is between the Malpai and the Service and is effective and binding on the date of the last signature in section 2.11.

Administrators of this Agreement are:

Malpai: Executive Director
Malpai Borderlands Group
6226 Geronimo Trail Road
Douglas, Arizona 85608

Service: Field Supervisor
Arizona Ecological Services Field Office
U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, Arizona 85021

In addition to the Malpai and the Service, this Agreement also encompasses any private landowner in the covered area who agrees to undertake, or to allow to be undertaken by other parties, applicable Chiricahua leopard frog management, reestablishment of populations, and other conservation enhancement measures as described in the Agreement generally, and who obtains a Certificate of Inclusion from Malpai as described in section 2.2 of the Agreement. For purposes of this Agreement, any such landowner is termed a "Participating Landowner." Landowners within or adjacent to the covered area who do not wish to directly participate in Chiricahua leopard frog management, reestablishment of populations, or other conservation enhancement measure, but are willing to follow minimization measures, may also gain assurances by obtaining a Certificate of Inclusion from Malpai. Any such landowner will be considered a "Participating Neighbor". The Agreement may also encompass certain State agencies, especially the Arizona State Land Department (ASLD) and New Mexico State Land Office (NMSLO), which administer State lands and grazing allotments in the covered area. For purposes of the Agreement, any such agency is termed a "Participating State Agency." Thus, this Agreement is effective and binding on any Participating Landowner, Participating Neighbor, and Participating State Agency as of the effective date of a Certificate of Inclusion issued by Malpai to that landowner or State agency. The obligations of all participants in this Agreement are summarized in section 2.7.

The primary difference between a Participating Landowner and a Participating Neighbor is that the Participating Landowner will typically volunteer to have Chiricahua leopard frogs established at one (or more) appropriate enrolled site(s) or enhance habitat where frogs already exist on the property, whereas the Participating Neighbor may receive frogs through natural movements and dispersal.

Additional cooperators under this Agreement may include, among others, the University of Arizona, Tucson; AGFD; NMDGF; and U.S. Geological Survey, Biological Resources Division (USGS-BRD). However, these and other cooperators will participate in the Agreement's conservation program pursuant to their own authorities and discretion and will not be parties to the Agreement's associated section 10(a)(1)(A) permit nor to any Certificates of Inclusion issued by Malpai in association with that permit.

2.1 Authorities and Purpose

Sections 2, 7, and 10 of the Act, and the Fish and Wildlife Coordination Act, allow the Service to enter into this Agreement. Section 2 of the Act states that encouraging parties, through Federal financial assistance and a system of incentives, to develop and maintain conservation programs is a key to safeguarding the Nation's heritage in fish, wildlife, and plants. Section 7 of the Act requires the Service to review programs that they administer and to utilize such programs in furtherance of the purposes of the Act. Lastly, section 10(a) of the Act authorizes the issuance of permits to "enhance the survival" of listed species.

The purpose of this Agreement, as described in section 1.1, is to provide for a conservation program for the Chiricahua leopard frog and for regulatory assurances to landowners who participate in the program.

2.2 Program Description

Procedurally, a Safe Harbor Agreement works as follows: 1) a landowner agrees to undertake specific voluntary conservation measures to benefit an endangered or threatened species on his or her lands (or not to undertake activities that would prevent future benefits); and 2) in return, the Service agrees that no additional regulatory restrictions will result if the species increases in numbers or distribution on the subject property beyond any restrictions that existed before the effective date of enrollment in the Agreement because of pre-existing populations or numbers of the species (termed "baseline conditions"). In practice, once the terms of the Agreement have been satisfied a landowner can alter any habitat enrolled under a Certificate of Inclusion to the extent that the increased habitat value to the affected species, gained through participation in the agreement, is lost (a process known as "returning to baseline"). In this case, it means that, if a Participating Landowner decides to alter or remove a stock tank enrolled in the conservation program under the terms of the Agreement, he or she may do so without regulatory restriction other than those that appear in the Agreement. However, any leopard frogs that pre-existed on the landowner's property upon the effective date of the Certificate of Inclusion (with the exceptions described in section 2.4, paragraph (B)) would remain under the full protection of the Act.

The Malpai will hold the Agreement's associated section 10(a)(1)(A) Permit if approved by the Service. Individual Malpai landowners who wish to become participants in the Agreement may do so by obtaining a "Certificate of Inclusion" from Malpai. The Certificate then conveys Malpai's permit authorities to the Participating Landowner. A pre-approved "template" Certificate of Inclusion for the Agreement is shown in Appendix A.

2.3 Covered Species, Covered Area, and Covered Habitats

This Agreement covers the Chiricahua leopard frog only. Its covered area (i.e., the area in which landowners may participate in the program) was identified in section 1.3.2 and Map 1.

Covered habitats under the Agreement are defined as all permanent and seasonal aquatic sites on a Participating Landowner's property, including stock tanks, that are not part of the baseline conditions as described in section 2.4 of the Agreement and documented in the landowners Documentation of Participation form (Appendix B).

2.4 Determining Baseline Conditions

In order for a Malpai landowner to participate in this Agreement, the baseline conditions on his or her property must be determined. Under the Service's Safe Harbor Agreement policy (64 FR 32717), baseline conditions are defined as "…population estimates and distribution and/or habitat characteristics and determined area of the enrolled property that sustain seasonal or permanent use by the covered species at the time the Safe Harbor Agreement is executed between the Service and the property owner."

The current distribution of Chiricahua leopard frogs in the covered area is highly limited (section 1.4); it is expected that baseline conditions for most properties enrolled under the Agreement will be zero, that is, that no Chiricahua leopard frogs will inhabit the property at the time of enrollment. Any Chiricahua leopard frog populations inhabiting a Malpai landowner's property prior to the date of enrollment in this agreement will be considered part of a baseline greater than zero. As such, populations that are part of a baseline greater than zero are not covered by this Agreement and its associated assurances. Populations that are part of the baseline greater than zero have full protection under the prohibition of take in section 9 of the Act, and are not covered by the Agreement's associated section 10(a)(1)(A) permit. The only exception to this may be 3 populations of frogs, it they currently exist, in Rosewood, Headquarters, and Bellency Tank on the Magoffin property. These populations exist due to the extraordinary efforts the Magoffins undertook beginning in 1994 to establish and maintain them (see Appendix E). The efforts included, but were not limited to, relocating the founder frogs to the property and hauling water to the frog habitats during times of low natural water to ensure the populations' survival. The Magoffins subsequently provided frogs to establish additional populations on the San Bernardino National Wildlife Refuge and for use in the Douglas High School breeding facilities. The Service believes that excluding the two Magoffin populations from the baseline conditions will not appreciably reduce the likelihood of the survival and recovery of the species in the wild, and is consistent with the intent of the Safe Harbor Policy.

Specific measures for determining baseline conditions under this Agreement are as follows:

(A) Baseline conditions shall be determined through the joint efforts of the Malpai, the Service, and Participating Landowner, Participating Neighbor, or Participating State Agency, as applicable, and as described in paragraphs (B) through (D) below. Baseline condition determinations will be made at the time that enrollment in the Agreement occurs.

Chiricahua leopard frog populations that pre-exist upon the enrollment date will be considered part of baseline conditions, with the exception of the 2 Magoffin populations discussed below. Leopard frog populations could conceivably colonize a landowner's property prior to the date of enrollment in the Agreement. Such populations would then be determined to be part of baseline conditions at the time of the Agreement enrollment. Baseline conditions for most properties enrolled under the Agreement are anticipated to be zero. Therefore, it would be to the advantage of any landowner, who believes Chiricahua leopard frogs currently do not occur on his or her property and who is considering enrollment in the Agreement, to request a baseline evaluation and enroll in the Agreement before natural colonization can occur. To ensure that Malpai landowners can make informed decisions about enrollment, the Malpai Borderlands Group shall, in writing, inform all Malpai landowners of the Agreement and urge them to participate.

(B) The 3 populations of frogs (Rosewood, Headquarters, and Bellency Tank) on the Magoffin property exist solely due to the extraordinary efforts of the landowners to establish and maintain them. Thus, although the populations pre-date the listing of the frog, they would be excluded

from the baseline for the purposes of this Safe Harbor Agreement, if Chiricahua leopard frog are present at the time of enrollment.

(C) The areas on Participating Landowner, Participating Neighbor, or Participating State Agency properties, as applicable, that will be subject to the baseline conditions determination are limited to aquatic sites on the property only, including stock tanks. In the event leopard frogs are known to already exist on the property, or are found as a result of a baseline condition determination, the baseline description will be consistent with paragraph (E) below.

(D) With the exception of the populations and areas listed in (B) above, baseline conditions on Participating Landowner, Participating Neighbor, or Participating State Agency properties, as applicable, shall be determined to be zero, unless: i) leopard frogs actually inhabit an aquatic site on the property at the time of a baseline determination; or, ii) it can be demonstrated that an aquatic site on the property has a history of regular leopard frog use, even if leopard frogs are not present at the site at the time of the determination). The finding under measure ii) shall be based on existing survey records or data conducted prior to a baseline determination and available to the Agreement's Administrators, or on information provided by the landowner. The parties to this Agreement explicitly understand that baseline conditions on a Participating Landowner's property will be determined between April and September in accordance with established survey protocol (Appendix D) or future revisions of this protocol.

(E) Where participating properties are determined to have an environmental baseline greater than zero (i.e., where specific stock tanks or sites are identified that support Chiricahua leopard frogs), the baseline shall include the aquatic site itself, any associated aquatic or emergent vegetation in the immediate vicinity of the site, and any other regularly wetted or saturated areas and associated vegetation in the immediate vicinity of the site. These areas shall be described in the Certificate of Inclusion, and detailed descriptions or maps showing the locations of the areas shall be attached to the Certificate. The baseline does not specifically include or require quantifiable numbers of frogs at a site; it only includes frog presence and characteristics of the site itself under the conditions described above.

The parties to this Agreement understand that any lands or waters on a Participating Landowner's, Participating Neighbor's, or Participating State Agency's property, as applicable, that are part of baseline conditions greater than zero are not included within the regulatory assurances otherwise provided by this Agreement, and that any such lands or waters will remain under any of the Act's restrictions or requirements that existed prior to the time of the effective date of the Agreement's associated Certificate of Inclusion for any given landowner.

2.5 Conservation Measures

2.5.1 The Metapopulation Concept and Biological Objectives

Rosen (1999) recommends that remaining Chiricahua leopard frog populations be managed in the form of "metapopulations." A metapopulation is an assemblage of smaller, local populations that are sufficiently close to each other to allow migrational interchange. In a metapopulation, the local populations may fluctuate or even be periodically extirpated, but the metapopulation remains intact because the processes of emigration and immigration replenish local gene pools. Rosen (1999) also describes what he calls conservation plan "areas" or "units" to which specific Chiricahua leopard frog management plans would apply. Two such units are the lower San Bernardino Valley/southern Peloncillos Mountains area and the Animas Mountains/Animas Valley (Gray Ranch) area. Taken together, these two units make up the

Agreement's covered area. For purposes of the Agreement, each is also regarded as a separate Chiricahua leopard frog metapopulation.

Based on the above, this Agreement identifies three biological objectives:

(A) To manage, establish, and distribute a system of "primary" and "secondary" leopard frog population sites (as defined in section 2.5.2) within the covered area, such that biological contact between local populations within each metapopulation is maintained (i.e., stock tanks and other aquatic sites on participating lands that support leopard frogs should be within dispersal distance of each other);

(B) To manage, establish, and distribute Chiricahua leopard frog populations within the covered area, such that sufficient distance between sites supporting leopard frogs and those supporting bullfrogs is maintained (this will help prevent migration by bullfrogs into leopard frog habitat); and,

(C) To manage for the primary importance of the metapopulation. In other words, while each local leopard frog population is important, it is the metapopulation that is essential. The occasional loss of individual leopard frog populations as a result of biological, climatic, economic, or other factors may therefore be acceptable under the Agreement, so long as the affected metapopulation persists (section 2.5.10, paragraph (D)).

2.5.2 Population Site Definitions

Chiricahua leopard frog populations will be managed and maintained under this Agreement primarily within aquatic sites constructed or operated for stock watering purposes. While such sites in some cases will consist of natural waters such as streams or springs, most will be man-made stock tanks. In either case, two types of leopard frog population sites are defined for purposes of the Agreement:

(A) Primary Sites. A primary (or core) site is defined as a permanent or semi-permanent water source of about ¼ acre in size or more. A primary site will have a relatively reliable water supply (e.g., a well or spring) and will typically retain water—or, at the least, subsurface moisture—year round in all years. An ideal primary site would be an earthen stock pond with a double tank and an auxiliary water supply fed by a well. Another type of primary site might consist of a single large or an aggregated group of concrete or steel "drinkers" fed by a well and set with a float valve to ensure a constant water supply. Furthermore, primary sites should also have terrestrial travel corridors or connectivity to secondary sites that will facilitate movement of frogs between sites. The primary criteria for a primary site are the amount, reliability, relative permanence of water, and the extent to which frogs can move from a primary site to neighboring sites. Biologically, primary sites will serve as relatively permanent leopard frog population sites from which translocation stock can be obtained, to which leopard frogs can move or be translocated, and from which natural emigration to other sites can occur.

(B) Secondary Sites. A secondary site is defined as a water source that is typically smaller than a primary site and/or one that may occasionally go dry. A secondary site would typically be expected to hold water year round on an average of one year out of two (i.e., 50% of years overall). A typical secondary site would be any stock tank configuration fed directly by run-off or by a storage tank fed by run-off (run-off-fed tanks hold water less reliably than well-fed or spring-fed tanks), or intermittent stream segments. Leopard frogs will most likely occupy secondary sites during wet years or seasons, to which they would migrate naturally, not via

reestablishment or translocation. An ideal location for a secondary site would be in or near a natural travel corridor such as a creek bottom or draw. Small "drinker" type configurations in such corridors would be ideal secondary sites.

2.5.3 Reestablishment and Distribution Criteria

A key element of this conservation program and the regulatory assurances for Participating Landowners will be the maintenance of existing leopard frog populations within the covered area; the establishment of new populations through leopard frog reestablishment, translocation, and natural migration and dispersal; and/or the enhancement of suitable habitats. For purposes of this Agreement, the term "establishment" means the movement of leopard frogs into the covered area from outside populations or locations; the term "translocation" means the movement of leopard frogs from one site to another within the covered area.

The leopard frog reestablishment/distribution criteria described below will be used to determine where reestablishment and translocation of Chiricahua leopard frogs within the covered area will occur and how they should be distributed. These criteria are designed to achieve the biological objectives described above and to establish and maintain suitable metapopulation dynamics through natural leopard frog colonization, dispersal, and interchange. However, in practice this may be difficult to achieve, at least in the early years of the program, and active management of leopard frog populations, including artificial interchange through ongoing reestablishment and translocations, will probably be necessary. Specific reestablishment/distribution criteria are:

(A). Establishment and translocation of new leopard frog populations within the covered area shall occur at primary sites only.

(B). Buffer areas shall be maintained between aquatic sites on the San Bernardino National Wildlife Refuge currently supporting bullfrogs and any newly established primary leopard frog population sites within the covered area. These buffers shall consist of a minimum of three miles overland distance between Refuge waters and Malpai primary sites, and a minimum of five miles distance between Refuge waters and Malpai primary sites within drainage lines (e.g., Hay Hollow, Black Draw, or Astin Draw).

(C). A suitable mix of primary and secondary sites shall be maintained. Primary sites are needed as refugia for leopard frogs during periods of seasonal dry weather and long-term drought, to provide areas to which frogs from secondary sites can move during such periods, and to provide sites from which recolonization can occur. Secondary sites are important as aids to natural dispersal during wet years and because primary (i.e., permanent and semi-permanent) sites in the Malpai area will be relatively scarce and alone may not be sufficient to maintain a healthy metapopulation. Thus, while most water sources on Malpai lands will be secondary sites, primary sites must be maintained at selected locations.

(D). To the maximum extent practicable, leopard frog distribution within each metapopulation on Malpai lands shall consist of: 1) A mixture of primary and secondary stock tank or other aquatic sites with at least one population site for each 4-16 square mile area; 2) A series of primary sites within eight miles of each other; 3) A minimum of 10 population sites for each metapopulation described in section 2.5.1, with at least three primary sites each; 4) A system of continuous population corridors consisting typically (but not exclusively) of secondary sites located in, near, or adjacent to travel corridors (eg., natural drainage lines) and spaced at 1-2½ mile intervals. This will encourage and support natural frog dispersal. Natural drainage lines that may serve as

population corridors within the lower San Bernardino Valley/Peloncillos Mountains metapopulation include Hay Hollow, Black Draw, Clanton Draw, Sycamore Creek, Guadalupe Canyon, Silver Creek, and Astin Draw. Natural drainage lines that may be utilized as population corridors within the Animas Mountains/Animas Valley metapopulation include Cloverdale Creek, Animas Creek, and Double Adobe Creek; and 5) A combination of stock tank types, including earthen stock ponds, steel tanks, concrete tanks, and above-ground and in-ground configurations.

(E). Prior to reestablishment or translocation of leopard frogs into any stock tank or other aquatic site within the covered area, the tank shall be inspected for suitability, and the following tank suitability criteria shall be satisfied to the maximum extent practicable (section 2.5.6, paragraphs (B) and (D)) for baseline information that must be collected prior to reestablishment or translocation): 1) Demonstrated absence, at the time of reestablishment or translocation, of bullfrogs, predatory fish, crayfish, and tiger salamanders; 2) A minimum of three miles overland distance and five miles in-drainage distance from known bullfrog populations; 3) For primary sites, presence, typically, of water year round; 4) Ideally, presence of some emergent vegetation within, near, or adjacent to (for earthen tanks) or near or adjacent to (for concrete or steel tanks) the water source; 5) For concrete or steel tanks, a means for frogs to get into and out of the tank and permanent or semi-permanent water depths of at least 18 inches; and 6) Presence of suitable water quality. Although specific leopard frog water quality tolerances are not currently known, this shall mean, at a minimum, that tank waters should not be anoxic, should not exhibit high sulfide levels, and should exhibit pH levels of no lower than 6.5 or higher than 9.0. Specific decisions concerning water quality suitability shall be subject to the concurrence of the Malpai Conservation Committee (Committee) (section 2.5.8).

(F). Sources for leopard frog reestablishment and translocations will include, but are not limited to, the San Bernardino Refuge leopard frog enclosure, existing leopard frog populations on Malpai or other lands, and *in situ* rearing facilities (e.g., on-site aquatic sites that are protected from predators from which young leopard frogs can disperse naturally to nearby population sites). Leopard frogs typically will be reestablished or translocated at the egg mass, tadpole, or metamorph stage.

(G). Leopard frog reestablishments and translocations shall be conducted in a manner that: 1) maintains, to the maximum extent practicable, genetic diversity within each leopard frog metapopulation; and 2) prevents disease transmission. To accomplish these two criteria, a Genetics Management Plan and Disease Prevention Protocol, respectively, will be prepared and implemented as described in section 2.5.9.

2.5.4 Required Minimization Measures

The combined use of stock tanks (natural or man-made) for livestock watering and as leopard frog habitat raises four areas of potential concern. These are: (A) the impacts of stock tank maintenance on leopard frogs; (B) the impacts of livestock use on leopard frogs and habitat quality; (C) the potential for introduction of disease or predatory aquatic species into ranch aquatic systems, and (D) the impacts of land treatments such as prescribed fire and herbicide applications, each of which is discussed below. Also discussed in this section is: (E) the "required conservation period" (the period during which conservation commitments under the Agreement must be implemented or maintained); and (F) development and approval procedures for individual landowner Certificates of Inclusion.

Stock Tank Maintenance. For earthen, run-off fed tanks, maintenance activities consist primarily of periodic removal of accumulated sediment via bulldozer, backhoe, or other heavy equipment. This is

required approximately once every 5-20 years and is typically done when the tank is dry or almost dry, in some cases requiring deliberate drying of the tank. Where leopard frogs are present, this would likely result in frogs being forced to vacate the tank, or in death or injury to frogs that remained in the tank. However, tank maintenance ultimately benefits ranchers and leopard frogs, since earthen tanks would otherwise fill with sediment and lose their value as frog habitat. Other types of tanks (e.g., steel or concrete) may also need periodic drying for maintenance purposes, though heavy equipment use in these cases is less likely, and leopard frogs can be captured for holding relatively easily in these types of tanks.

Livestock Use. Livestock use of stock tanks is a normal and expected activity at aquatic sites under this Agreement, including sites that support leopard frog populations. While livestock and frog use of aquatic sites is generally compatible, careful management of livestock use at tanks occupied by leopard frogs will be essential to success of the Agreement's conservation program. Absent such management, livestock use could result in destruction or deterioration of leopard frog habitat through excessive trampling, destruction of egg masses and vegetation, and fouling of water quality. Livestock use could also inadvertently result in transmission of chytridiomycosis; this might occur if the disease was present in the area and was spread by livestock (or humans) moving from infected tanks to uninfected tanks.

Introduction of Predatory Species. The colonization of leopard frog habitats by non-native aquatic predators, whether by natural dispersal or by deliberate or inadvertent introduction, is an ever-present threat to Chiricahua leopard frog populations (65 FR 37343, Rosen 1999). Non-native predators adversely affect leopard frog populations by preying on tadpoles, metamorphs, young frogs, and, possibly, egg masses. Bullfrogs and tiger salamanders are often unaffected by chytridiomycosis and can serve as carriers, spreading the disease among sites (Daszak *et al.* 2003, Bradley *et al.* 2002, Collins et al. 2003). Presence of these species often results in the extirpation of leopard frogs from otherwise suitable habitat. Consequently, prevention or minimization of such introductions and control of non-native predators where they occur, as described below, are essential features of the Agreement. However, such measures must also be implemented and timed in such a fashion that needed ranch operations are not significantly prevented or disrupted.

Land Treatments. Managers of rangeland in the southwestern United States often desire to apply periodic disturbance, such as prescribed fire, herbicide applications, chaining or grubbing, to control shrub invasion and maintain current seral stages. These activities usually disturb the vegetation cover and can expose soils to increased erosion. In areas where rain filled tanks exist, run off can carry increased sediment loads, along with ash and other contaminants into aquatic habitats. Sedimentation and ash can kill eggs and larval frogs and decrease the life of the aquatic habitat. This would necessitate increased need to maintain the tank and increase the potential take of individual frogs. In addition, herbicides can have a variety of effects on ranid frogs, and even at very low levels, have been implicated in endocrine system disruption in leopard frogs (Diana and Beasley 1998, Hayes *et al*. 2002). While these activities may be beneficial to the upland terrestrial habitats, they may result in short-term detrimental effects to aquatic habitats down slope. Therefore, planning of these land treatments should consider buffers around aquatic habitats and best management practices to reduce the amount of erosion and runoff that enters the enrolled aquatic habitats.

In light of the above considerations, Participating Landowners must implement the following measures if they agree either to maintain existing leopard frog populations on their lands or to permit reestablishments of new populations (unless otherwise indicated, these measures are mandatory and are incorporated into the Certificate of Inclusion issued by Malpai to the Participating Landowner):

(A). (i) Routine stock tank maintenance. To avoid excessive mortality or extirpation of leopard frogs during regularly scheduled tank maintenance activities (including deliberate drying of a tank

prior to maintenance), a landowner shall commit to one or more of the following, as appropriate: 1) subject to available funding, construct a double tank system (option A), a small refugia site (option B), or a fence (option C) as described in section 2.5.5; 2) where practicable, implementation of tank maintenance regimes, schedules, or techniques that maintain a portion of the tank as escape cover for resident frogs during maintenance activities; 3) allow all equipment used for stock tank maintenance to dry thoroughly or to sterilize equipment before moving to another site to prevent disease transmission, and 4) the grant of permission to appropriate (e.g., the Service, AGFD, or NMDGF) personnel to collect and hold leopard frogs from the tank during maintenance activities and to return the frogs to the tank upon completion of maintenance activities, and, in this event, to provide 30 days notice to such personnel prior to commencement of maintenance operations (section 2.6.2, paragraph(C)). In addition, all tank maintenance activities shall be conducted during the period when leopard frogs are most active (April 1 to October 31), unless otherwise approved by the Committee. If, however, none of the above measures are desired or feasible for a given stock tank, then leopard frogs will be translocated into such a tank only if it meets short-term habitat goals and only with the concurrence of the Committee.

(ii) Emergency stock maintenance. From time to time it may be necessary for a Participating Landowner to undertake immediate repair or maintenance actions at a stock tank in emergency situations (e.g., a flood event in which a tank is in danger of washing out). In such cases, the notification requirements described in the preceding paragraph and in section 2.6.2, paragraph (C) of the Agreement with respect to tank maintenance activities shall be considered waived, and the landowner may proceed with corrective actions as needed provided, however, that the Landowner reports the circumstances of the action to the Malpai not more than 72 hours after the situation triggering the action has ended or been controlled. The Malpai, in turn, shall inform the Service of the incident within 15 days of receipt of the landowner's notification. If, in the subsequent judgment of the Malpai, the Service, and the Committee, significant damage to leopard frog habitat has occurred as a result of the action, the situation will be regarded as an altered circumstance as described in section 2.5.10 and actions to restore leopard frog habitat, if any, will be implemented consistent with that section. For purposes of this paragraph, an emergency situation is defined as any in which, in the sole judgment of the Participating Landowner, a stock tank is in imminent danger of destruction or significant damage as a result of emergency or urgent conditions.

(B). Livestock grazing in and around stock tanks supporting leopard frogs shall be managed so as to avoid destruction or excessive deterioration of leopard frog habitat. This shall include: 1) subject to available funding and approval by the Participating Landowner, fencing as described in section 2.5.5, paragraph (D); 2) avoidance of excessive trampling, especially during frog breeding periods when egg masses are easily destroyed (specified here as February 25 through October 31); 3) appropriate management of the numbers and seasonality of livestock use to avoid excessive sedimentation, erosion, or degradation of water quality; and 4) such other measures as may be agreed to by the Malpai, the Service, and a Participating Landowner, including those designed to prevent transmission of frog diseases as discussed in section 2.5.9. The Participating Landowner, however, must approve any such measures.

(C). The introduction of non-native aquatic predators into leopard frog habitat shall be prevented or otherwise minimized and controlled via the following measures: 1) commitments by Participating Landowners not to knowingly engage in releases of bullfrogs, non-native predatory fish, crayfish, or tiger salamanders into leopard frog habitats on participating properties by ranch owners or ranch personnel, and not to knowingly permit any other person or organization to

engage in such releases on participating properties; 2) commitments by Participating Landowners to report any observed occurrences of such species in leopard frog habitats on participating properties to the Malpai, the Service, or other program cooperators; 3) commitments by Participating Landowners to permit access to their ranch lands by appropriate personnel, including Service representatives, necessary to implement control programs for these species (subject to 14-day advance notice); and 4) where appropriate, subject to the approval of the Participating Landowner, control measures may be conducted when requested by the Malpai, the Service, and the Committee (e.g., temporarily drying out stock tanks that support such species).

(D). Prescribed fire, herbicide treatments, and other land treatments that alter vegetation or change run off characteristics can have a detrimental effect on aquatic sites. This is through the introduction of ash, sediment, herbicide, and other contaminates into the aquatic environment. While these activities may have a long-term beneficial effect for the aquatic habitat, the short-term effects could result in loss of populations in primary and secondary sites. To prevent loss of populations in this manner, any land treatment upstream of an enrolled site should include measures such as buffers around drainages, erosion control structures, and buffers around the enrolled sites to minimize possible effects, as applicable. Participating Landowners, Participating Neighbors, and Participating State Agencies should work with Malpai and the Service to develop effective minimization measures on a case-by-case basis, where applicable.

Required Conservation Period. Each Certificate of Inclusion issued by Malpai to a Participating Landowner must specify the time period, 10-year minimum, during which the leopard frog conservation measures identified in the Agreement will be maintained or implemented. This is termed the "required conservation period." Conservation commitments under the Agreement typically required during this period are: 1) the grant of permission to Malpai, the Service, and other program cooperators to manage existing leopard frog populations on their lands and/or to reestablish new populations on their lands at suitable aquatic sites; 2) completion of any Conservation Enhancement Measures (section 2.5.5) consented to in the Agreement; 3) implementation of the measures described in paragraphs (A) through (D) of this section; and 4) appropriate notification as described in section 2.6.2. The required conservation period is considered the minimum that a landowner must implement in order to obtain the program's regulatory assurances. The assurances will run for two years past the required conservation period, but can not be given past the term of the section 10(a)(1)(A) permit (section 2.9 and 3.6). However, the Malpai and the Service anticipate that most Participating Landowners will continue to implement most or all the Agreement's conservation commitments even after the required conservation period has been satisfied. This is because livestock ranching and the Agreement's conservation program are specifically designed to be compatible under this Agreement. Thus, in most cases Participating Landowners are expected to have little incentive or need to discontinue their commitments. Nevertheless, Participating Landowners may, if necessary, terminate their conservation commitments under the Agreement at the end of the required conservation period, and may even terminate or reduce their conservation commitments prior to the end of the required conservation period through the "early termination of conservation commitments" procedures described in section 3.2 of the Agreement. However, early termination will result in the loss of assurances upon termination of participation. Participants will be allowed to return enrolled sites back to baseline at or prior to any early termination of participation in cooperation with Malpai, the Service, and other program cooperators (section 3.6), unless the return of a particular site will result in jeopardizing the continued existence of the species.

In light of the above, the required conservation period for Certificates of Inclusion under this Agreement shall be:

(E). A required conservation period of ten (10) years is required, except that longer conservation periods are allowable under the Agreement and are encouraged. The conservation period actually agreed to within individual Certificates of Inclusion will depend on several circumstances, including whether or not the landowner has any future land use plans at a given tank site, whether or not conservation measures under the Agreement have included a material benefit to the landowner (i.e., all or partial funding of a well, in which case a longer conservation period would be appropriate), and the landowner's comfort level. Any conservation period in excess of ten years must have the consent of the Participating Landowner, and the specific conservation period agreed to must be specified within the Landowner's Certificate of Inclusion

(F). Five-year review. Any Participating Landowner may, at the end of the fifth year, or at any 5-year interval, of any applicable Certificate of Inclusion, request termination of his or her conservation commitments under the Agreement by submitting to the Service in writing a request for such termination and an explanation of the reasons for such termination. Within 60 days of the receipt of any such request, the Service shall reply in writing to the landowner and acknowledge the receipt of the request and make arrangements with the landowner and Malpai to return the property to baseline. However, after the ten-year required conservation period has been satisfied, any Participating Landowner may, at his or her discretion, terminate the conservation commitments under his or her Certificate of Inclusion without Service review and approval. That option notwithstanding, the parties to this Agreement anticipate that most Participating Landowners will continue to implement the conservation commitments under a renewed Certificate of Inclusion beyond the required ten-year period so long as such implementation is not inconsistent with productive livestock grazing.

Development and Approval of Certificates of Inclusion. When any Malpai landowner is interested in enrolling lands under this Agreement (i.e., is willing to become a Participating Landowner), the following procedures shall be implemented:

(G). First, the specific conservation measures to be implemented by that landowner will be developed jointly by the landowner, Malpai, the Service, and, as appropriate, the Committee. Concurrently, a baseline for the aquatic sites to be considered for inclusion in the Agreement will be determined per established survey protocol (Appendix D). Where appropriate ASLD or NMSLO as applicable should be included in this process. Conservation measures under the Agreement will include, at a minimum, applicable measures as described in sections 2.5.4, 2.6.2, and 2.7 of this Agreement. To achieve a net conservation benefit it is expected that Participating Landowners will select conservation enhancement measures described in section 2.5.5, as appropriate, to provide for the survival of reestablished frog populations or to enhance existing habitat or populations. Once specific measures are agreed to, the landowner, Malpai, ASLD, and NMSLD, as applicable, will complete the Certificate of Inclusion (Appendix A) and associated Documentation of Participation Form (Appendix B) and submit these forms to the Service for concurrence.

(H). Within 30 days of receipt of a proposed Certificate of Inclusion, the Service will notify Malpai, the affected landowner, and the ASLD or NMSLO, as applicable, in writing of its concurrence or non-concurrence concerning the landowner's enrollment. Since the Service in most cases will have helped develop the conservation measures, its concurrence in the enrollment will normally be expected, unless it otherwise notifies or has notified the Malpai, landowner, or any Participating State Agency that the conservation measures are deficient with respect to the Agreement's requirements or would not be expected to benefit the Chiricahua leopard frog.

However, entry into this Agreement by any Malpai landowner is entirely voluntary. Thus, if agreement cannot be reached between the parties described above with respect to the enrollment application, the affected landowner is under no obligation to enter the Agreement.

2.5.5 Conservation Enhancement Measures

The key component of this agreement is the reestablishment of frogs into enrolled habitats on Participating Landowner's property and/or the enhancement of existing habitat. Each site considered for leopard frog reestablishment or translocation will present its own considerations and challenges. A key consideration will be what, if any, improvements to the aquatic site's structure, design, depth, size, or other features will be implemented to improve leopard frog habitat quality and reliability and to achieve the Agreement's biological objectives. This section presents a range or "menu" of conservation enhancements that may be considered in determining what specific measures will be implemented at a given enrolled site. These enhancements will be considered on a case-by-case basis at the time a landowner elects to participate in the Agreement. If the landowner agrees to implement one or more of these enhancements, that commitment will be described in the landowner's Certificate of Inclusion. However, cost will be a key consideration, and full or partial funding assistance to the landowner from the Agreement's funding mechanisms will likely be necessary in implementing many of these measures. Specific enhancements are:

(A). Leopard frog establishment. Leopard frog populations may be established at appropriate sites in accordance with Section 2.5.2. Existing leopard frog populations at primary sites may also be augmented if necessary to meet the biological goals for metapopulation management.

(B). Construction of a double tank system. A double tank system is ideal for a leopard frog population site. In this configuration, one tank serves as a sediment trap and the other as the primary water reservoir. The advantage of this system is that during tank maintenance activities the sediment trap is cleaned out (via bulldozing, dredging, or other means) while the reservoir tank remains relatively undisturbed. The reservoir tank consequently functions as a refugium for resident leopard frogs during tank maintenance, reducing the killing or injuring of frogs that might otherwise occur during sediment clearing activities.

(C). Construction of small refugia sites at single tank systems. This is a potential alternative to a double tank system. In this configuration, a small refugium, consisting of a second aquatic site, is provided or constructed near or adjacent to the primary tank. The refugium can consist of a steel or concrete tank or "drinker," wetted pasture, or natural feature (e.g., a scour basin in a nearby drainage) fed by a well, spring, or storage tank. The refugium provides cover to which frogs can escape during maintenance activities at the primary tank or can be used as a holding area to which frogs can be temporarily moved. However, any non-earthen (i.e., steel or concrete) tank system intended to support leopard frogs must include design features allowing for ingress and egress by the frogs, and, at the same time, must prevent entrapment and drowning of other animals.

(D). Fencing. Fencing is a suitable option at any tank configuration or natural aquatic site. The purpose of fencing is to prevent destruction or excessive deterioration or trampling of leopard frog habitat at an aquatic site. This can be accomplished by fencing an aquatic site in its entirety (if not needed as a stock or wildlife water source) or fencing only a portion of a site. The fenced portion provides relatively undisturbed aquatic habitat and escape cover during maintenance activities and livestock use.

(E). Deepening the tank. Tank deepening can increase the amount of water in a tank, ensuring that the tank will retain water longer during periods of dry weather or drought. It creates more permanent leopard frog habitat and can be used to upgrade a secondary population site into a primary population site. However, too deep a tank may be difficult to dry out for maintenance purposes or to rid the tank of bullfrogs (e.g., if the tank is close to the limits of bullfrog dispersal). Thus, tank deepening should balance the needs of relative water permanence with the ability to deliberately manipulate water levels in the tank.

(F). Well drilling. Well drilling is an ideal means to create a permanent and reliable stock water source for livestock and frogs, and any type of stock tank can be fed by a well. However, drilling and maintaining a well can be expensive and will be used only in circumstances that are technically and financially feasible.

(G). Pipelines. Pipelines under this Agreement would typically be used to connect stock tank sites (primary or secondary) to a water source. Pipelines can be constructed of a variety of materials, in a variety of configurations (e.g., buried or laid on the ground), and can be used to improve water reliability at existing tank sites or to feed new tanks. However, pipelines raise several technical considerations (e.g., topography, distance traveled) and will be used only when technically and financially feasible.

(H). Removal of aquatic predators from otherwise suitable sites. In some cases, otherwise suitable aquatic sites within the covered area may already contain bullfrog populations or populations of other predatory species. Such sites could be converted to leopard frog population sites if the non-natives can be eliminated. While this strategy will depend on the feasibility of removing the exotics (e.g., on the type of species involved, the size of the water source, etc.), it should be considered at selected sites.

(I). Maintenance of existing habitat conditions. In some situations, a commitment to maintain existing conditions may provide a net conservation benefit to the frog. This option is useful when future threats are predictable and probable. Preventing the future diversion of water from suitable sites or maintaining seral stage of a pond or wetland by removing encroaching climax or invasive vegetation may be appropriate.

(J). Enhancement of travel corridors. Travel corridors along drainage lines and across upland areas are of particular importance in maintaining metapopulations. In areas where these corridors may be extremely long or subject to disturbances, it may be beneficial to enhance the aquatic and terrestrial habitat within these corridors. Shallow depressions that catch rainwater and provide temporary aquatic sites between primary and secondary sites would facilitate unencumbered movement within a metapopulation. In addition, fencing or road closures (seasonal or permanent) and rehabilitation of disturbed areas would also facilitate movement. Such enhancements should not overly benefit or promote dispersal of non-native predators, such as bullfrogs.

(K). Enhancement of stream and cienega habitats. In some areas natural streams, perennial and intermittent, and cienegas will exist on a landowner's property. Enhancement of theses areas through options similar to paragraphs B, C, E, F, G, and / or I, discussed above, would also be beneficial. Improvements to correct incised channels would also be beneficial for leopard frogs.

(L). Vegetation enhancement. In existing and new habitats it would be beneficial for riparian vegetation to be enhanced within enrolled sites. This may included vegetation to stabilize

shorelines and banks or emergent and submerged vegetation to provide aquatic habitat structure and cover for Chiricahua leopard frogs.

2.5.6 Monitoring and Reporting

This Agreement provides for two types of monitoring as required by Service policy (64 FR 32717-32726) and Federal regulation (and NMFS 1999c): 1) compliance monitoring (to ensure that all commitments in the Agreement are being met); and 2) biological monitoring (to ensure that the biological goals of the Agreement are being met and to determine the effectiveness of its conservation program).

Compliance Monitoring. The Service or any authorized representative of the Service will conduct compliance monitoring under this Agreement. Specific requirements are:

(A) A maximum of two visit per year (and a minimum of one visit per two years) for compliance monitoring to each leopard frog population site subject to this Agreement to verify that all agreed upon conservation commitments are being properly implemented. Prior to any such visit, Service monitoring personnel or representatives shall give notice to the Participating Landowner of not less than 14 days prior to the visit and shall arrange the visit in a manner that is compatible with the landowner's schedule and needs. This monitoring requirement shall commence from the effective date of the Certificate of Inclusion for each affected Participating Landowner.

Biological monitoring. Biological Monitoring under this Agreement will focus on the success of the two Chiricahua leopard frog metapopulations described in section 2.5.1 and the factors affecting those metapopulations. Specific criteria that biological monitoring will address are: 1) the success of Chiricahua leopard frog reestablishments and translocations conducted under the Agreement; 2) the distribution of Chiricahua leopard frogs within each metapopulation in the covered area and the degree to which that distribution satisfies the criteria described in section 2.5.3; 3) the distribution of known bullfrog populations and populations of other non-native aquatic predators within each metapopulation relative to leopard frog population sites; 4) monitoring of disease, and 5) the need for adjustments to the Agreement's conservation program through the Adaptive Management provisions described in section 2.5.7. Specific biological monitoring requirements are as follows:

(B) Prior to reestablishment or translocation of Chiricahua leopard frogs to any stock tank or aquatic site on participating lands, an information "baseline" shall be established. This baseline shall include the following information: 1) type of tank or site (earthen, steel, concrete, or natural); 2) whether the tank will be managed as a primary or secondary site; 3) a general description of the tank and its condition; 4) what, if any, improvements will be made to the tank as described in section 2.5.5; 5) initial presence or absence of non-native aquatic predators; 6) history of the tank with respect to occupancy by leopard frogs; 7) depth, size, and bank conditions of the tank or site; 8) history of the tank with respect to livestock use (e.g., numbers, seasonality); 9) basic water chemistry (subject to available funding for water quality analysis), 10) source of water, and, 11) any other pertinent information.

(C) For any stock tank or other aquatic site on participating lands to which Chiricahua leopard frogs have been established or translocated: 1) one monitoring visit per day for four days, followed by one visit per week for four weeks, followed by one visit every other month for one year. For an established population site (i.e., one for which the preceding schedule has been met or one that supported leopard frogs prior to the effective date of the Agreement): 2) one visit every 3-6 months, depending on circumstances (e.g., the presence or absence of problem conditions, such as uncertain water levels or bullfrogs), to continue throughout the term of the Agreement. The

monitoring schedule described in this paragraph shall remain in effect unless the Committee determines that a more frequent or a less frequent schedule is appropriate.

(D) Information to be collected during site visits described in paragraph (C) above shall consist of the following: 1) type of tank or site (earthen, steel, concrete, or natural); 2) whether the tank is a primary or secondary site; 3) general description of the tank and its condition, including water depth, water quality (subject to available funding), vegetation and bankline condition, and other pertinent features; 4) presence or absence of leopard frogs and numbers of frogs, egg masses, tadpoles, or metamorphs, where determinable; 5) presence or absence of non-native aquatic predators, where determinable; 6) presence or absence of other frog predators; 7) presence or absence of livestock; 8) impacts, if any, of livestock use or tank maintenance activities; 9) source of water, and 10) and any other pertinent information.

Responsibility for Biological Monitoring. Biological monitoring under this Agreement will be funded and carried out primarily through the joint efforts of State and Federal agencies, academic institutions, conservation organizations, and other entities as described in section 2.7. The Biological Monitoring will be conducted in accordance with the *Rana chiricahuensis* - Fish and Wildlife Service/Arizona Game and Fish Department/New Mexico Department of Game and Fish Survey Protocol for Project Evaluation in Appendix D, or future revisions to this protocol, provided any revision does not add any significant undue burden upon the participants. Biological monitoring activities described in this section will be conducted in three ways: 1) by agency, academic, and conservation personnel acting in the normal course of their official duties (to the extent budgets and staff time permit); 2) by funding biological monitoring activities through the Agreement's funding mechanisms; and 3) where appropriate, by Participating Landowners provided that the landowner consents to conduct monitoring activities. Otherwise, the primary obligations of Participating Landowners with respect to biological monitoring will be to grant access to their properties by personnel conducting the monitoring, subject to reasonable advance notification, and to monitor the impacts of livestock use on leopard frog population sites on their properties as necessary to ensure that the measures described in section 2.5.4, paragraphs (A) to (D) are being satisfied.

Annual Report. The Malpai, as the permittee under this Agreement, shall submit one copy each to the Service's Arizona Ecological Services Office, New Mexico Ecological Services Office, and Albuquerque Regional Office at the beginning of each year a report describing activities under the Agreement for the preceding year. The annual report will be due by February 15 of each year throughout the term of the permit, except that if the first year of the Agreement is a partial year of six months or less, activities implemented in that year may be reported in the following year's report. Information required in the annual report is as follows:

(E) A summary of: 1) the cumulative total of Participating Landowners (as well as Participating Neighbors and Participating State Agencies) enrolled in the Agreement at the time of preparation of the report; 2) the cumulative total of leopard frog populations being managed in each metapopulation at the time of the report, including a description of the status of the populations and their associated habitats; 3) the status of each metapopulation within the covered area at the time of the report with respect to the Agreement's biological goals and reestablishment/ distribution criteria; 4) any Participating Landowners, Neighbors, or State Agencies that enrolled under the Agreement in the preceding year, including copies of any related Certificates of Inclusion; 5) any leopard frog management activities that were implemented in the preceding year, including leopard frog reestablishments or translocations and stock tank improvement projects; 6) funding sources that were used in the preceding year and funding sources expected to be obtained in the following year; 7) any incidental take of leopard frogs known or suspected to have occurred within the covered area in the preceding year and an explanation of the reasons for

the take; 8) pertinent results of biological monitoring activities conducted in the preceding year, especially with respect to any biological or habitat-related problems that need to be addressed; 9) the dates that the Committee met in the previous year and a brief description of any pertinent activities undertaken by the Committee; and 10) any other pertinent information regarding the status of the Agreement's conservation program or implementation of the program by any permittee, Participating Landowner, Participating Neighbor, Participating State Agency, or other program cooperator.

2.5.7 Adaptive Management

Adaptive management allows a conservation program to be adjusted from time to time to take into account new scientific information and to ensure that the program is as effective as possible. Several aspects of Chiricahua leopard frog biology and population dynamics are not currently well understood, including dispersal distances, mortality during drought, adult and larval survivorship, the role of disease and pollution, and population dynamics (Rosen 1999). A recovery plan will be prepared during 2003-2006, which will further define conservation priorities. Furthermore, the Agreement will need to respond to specific management opportunities and needs as they arise. The Agreement therefore includes an Adaptive Management program to ensure flexibility and that the most up-to-date scientific information is used.

The need to adopt Adaptive Management modifications to the Agreement may result from four potential sources: 1) new scientific information concerning the biology or population dynamics of Chiricahua leopard frogs or non-native predators of leopard frogs; 2) new scientific information concerning the effects of other biotic or abiotic factors on leopard frogs; 3) information derived from the Agreement's monitoring program; and 4) management needs or recommendations described under any future Chiricahua Leopard Frog Recovery Plan, if and when one is prepared.

Two types of Adaptive Management modifications within the covered area may be implemented under this Agreement, depending on their scope and the process for incorporating them. These are termed: 1) major revisions to the Agreement and 2) ongoing management adjustments. A major revision is defined as one triggered by the availability of substantial new scientific information, typically from a source not related to the Agreement, concerning any biological assumption or criterion upon which the conservation program is based and that would require modification of any of the Agreement's specific biological criteria or conservation measures. Examples of circumstances requiring a major revision would include new information suggesting that the Agreement's reestablishment/distribution criteria are inadequate to meet its biological objectives, or that additional management measures not described in the Agreement are needed to ensure survival of leopard frog populations within the covered area (e.g., as a result of disease or pollution). Major revisions would likely require that the Agreement be amended to reflect any required new standards or management activities. This, in turn, would require mutual agreement between the Malpai and the Service, and written formalization of the amendment as described in section 3.2.

Ongoing management adjustments are defined as those typically triggered by the Agreement's monitoring program concerning any situation within the covered area that requires a management response that is within the scope of the existing Agreement. Examples of circumstances requiring ongoing management adjustments would be the identification of specific problems within the covered area that need corrective action (e.g., that the distribution of leopard frog populations within a metapopulation is not meeting the Agreement's reestablishment/distribution criteria); problems at a specific leopard frog population site or sites within the covered area (e.g., colonization by bullfrogs, drought, or extirpation of a population); or, the identification of specific management opportunities or needs that would benefit the conservation program (e.g., a stock tank site that, with improvement, could be upgraded from a secondary to a primary

site). The Malpai, the Service, the Committee, and other program cooperators, including Participating Landowners, will typically address ongoing management adjustments collaboratively. Sections 2.5.4 (Required Minimization Measures), 2.5.8 (Malpai Conservation Committee), and 2.5.10 (Altered Circumstances) all describe conditions that could potentially require ongoing management adjustments, as well as the standards that will be considered in determining the appropriate adjustment or response.

Any Adaptive Management revisions or adjustments as described above will need to be consistent with the regulatory assurances described in section 2.9 of the Agreement. Consequently, Adaptive Management modifications that would result in the commitment of funding or conservation measures not identified in this Agreement or an associated Certificate of Inclusion by the Malpai or a Participating Landowner would require the consent of the Malpai or landowner, as applicable.

2.5.8 Malpai Conservation Committee

The Committee will be established under this Agreement to oversee ongoing implementation and management of its conservation program. The essential role of the Committee will be to assist the Agreement's administrators (Malpai and the Service) and Participating Landowners in making routine technical decisions and to ensure that the conservation program is implemented in a biologically sound manner. It will also ensure that the conservation program is implemented compatibly with necessary ranch operations. The Committee will not make decisions of a legal or regulatory nature. Specific responsibilities of the Committee are to:

(A). Assist the Malpai, the Service, and Participating Landowners in making decisions concerning: 1) suitability, location, and type (i.e., primary or secondary) of leopard frog reestablishment or translocation sites; 2) improvements, if any, needed at such sites and at existing sites; 3) adequacy of the number and distribution of leopard frog population sites within each metapopulation relative to the biological objectives and reestablishment and distribution criteria described in sections 2.5.1 and 2.5.3, respectively; 4) management actions needed to meet those biological objectives and to minimize frog mortality during adverse habitat conditions; 5) the need for adjustments to the reestablishment/distribution criteria and other program features under the Adaptive Management program; 6) any genetics planning, disease screening procedures, and captive propagation needed in conjunction with planned leopard frog reestablishments or translocations within the covered area as described in section 2.5.9; and 7) such other technical assistance as may be requested by the Malpai or the Service; and,

(B). Assist the Malpai, the Service, Participating Landowners, Participating Neighbors, and/or Participating State Agencies in ensuring that the conservation program is compatible with needed ranch operations and vice versa, including decisions concerning: 1) livestock numbers and seasonality of use at stock tanks supporting leopard frogs; 2) impacts, if any, of livestock use of stock tanks on leopard frog habitat and the measures, if any, needed to minimize such impacts; 3) what activities in addition to those specified in sections 2.5.4 and 2.5.5 that Participating Landowners or Participating Neighbors might voluntarily undertake to improve or maintain leopard frog habitat on their properties (understanding, however, with respect to measures 2) and 3) above, that any such activities must be compatible with the regulatory assurances described in section 2.9 of the Agreement); and 4) such other technical assistance as may be requested by the Malpai, the Service, Participating Landowners, Participating Neighbors or Participating State Agencies concerning integration of ranching and the Agreement's biological goals on participating lands.

Malpai Conservation Committee Membership and Operations. The Committee should be composed, at a minimum, of representatives from: 1) the Malpai Borderlands Group; 2) the Service (including the Arizona Ecological Services Field Office, New Mexico Ecological Services Field Office, and San Bernardino NWR); 3) Participating Landowners, as necessary or desirable; 4) AGFD; 5) NMDGF; and, 6) recognized species experts, most likely from academic institutions (e.g., the University of Arizona, Tucson) or other agencies or organizations (e.g., USGS/BRD). Participation by Douglas High School, Phoenix Zoo, The Nature Conservancy, and other pertinent Federal or State land management agencies (e.g., USFS) would also be appropriate.

Within 90 calendar days of the effective date of this Agreement, representatives of the Malpai, the Service, and any Participating Landowners then enrolled in the program will meet and develop, by mutual consent, a written protocol for Committee operations. The protocol will specify Committee membership, Committee meeting schedule, a process for making technical Committee decisions, a dispute resolution process if determined necessary, and other details as necessary. However, operations of the Committee should be kept relatively simple and streamlined in order to react to the needs of the program. To achieve this, it may be advisable to limit Committee membership to essential personnel, or, if broader participation is desired, to establish a technical subcommittee for making decisions of a technical or biological nature.

2.5.9 Genetics Plan, Disease Prevention Protocol, and Captive Propagation Facilities

Genetics Plan. Maintaining genetic diversity in Chiricahua leopard frog populations within the covered area through careful population management will be an important issue during implementation of this conservation program. Population genetics management under the program would have two goals: 1) to maintain genetic diversity within each metapopulation in the covered area (i.e., the San Bernardino Valley/Peloncillos Mountains metapopulation and Animas Valley/Animas Mountains metapopulation); and 2) to maintain distinct genetic variation between these two metapopulations. The former of these goals is important in ensuring that each metapopulation is genetically fit, the latter in contributing to leopard frog genetic diversity throughout the species' range. Such goals will be a challenge, however, since leopard frog populations in both areas have been reduced to very low numbers in recent years. In light of these considerations, the following measure shall be implemented:

(A). Within one year of the effective date of this Agreement, the Malpai and the Service, working with the Committee, shall develop a Genetics Management Plan designed to achieve the goals described in the above paragraph. This Plan will include, at a minimum, appropriate criteria or policy for determining donor populations for leopard frog reestablishment and translocations into and within each of the metapopulations in the covered area.

Disease Prevention Protocol. As described in section 1.3.4, Chiricahua leopard frogs may be subject to a number of diseases, including chytridiomycosis. Chytridiomycosis is transmissible through zoospores that swim through water or through direct contact between frogs. The disease can likely be spread via bullfrogs, salamanders, or possibly other organisms moving among aquatic sites; by muddy or wet boots, vehicles, or other equipment during frog management activities; as a result of livestock grazing activities; and through flood events and natural migration of frogs. Therefore:

(B). Within one year of the effective date of this Agreement, the Malpai and the Service, working with the Committee, shall develop a Disease Prevention Protocol that specifies the measures necessary to prevent transmission of chytridiomycosis and other communicable frog diseases to and among leopard frog populations within the covered area. Such measures would include, at a minimum, screening with PCR tests of any frogs reestablished or translocated within the covered area,

periodic monitoring of populations for chytridiomycosis with PCR testing, appropriate equipment handling procedures (e.g. letting equipment dry, or disinfecting equipment, prior to moving to another aquatic site), identification of any technical expertise that will be needed in disease screening and other activities under the Protocol, and possible sources of such expertise. In some cases, it may be appropriate to salvage frogs and dry out stock tanks to eliminate chytridiomycosis. Frogs can be treated and cleared of the disease with itraconazole (Nichols and Lamirande 2003) and returned to the tank once it refills.

Such measures could also include specific livestock management protocols, if clear evidence linking disease transmission to livestock movements becomes available. Such protocols could include making sure that livestock dry thoroughly before moving among pastures or stock tanks, or that livestock hooves and legs are cleansed in non-frog waters prior to such movements. However, disease prevention measures, if any, assigned to Participating Landowners in addition to the measures described in section 2.5.4 would have to have the consent of the affected landowner, unless such measures were specified in the landowner's Certificate of Inclusion or are required as a response to altered circumstances (section 2.9.3).

Captive Propagation, Holding, and Disease Treatment. Captive propagation of leopard frogs will be needed under this program, especially in the early years, since natural donor populations for leopard frog reestablishment and translocations are limited. In addition, there will likely be a need to temporarily hold frogs that are rescued from drying stock tanks or tanks that need to be maintained, and to hold frogs that need to be treated for chytridiomycosis. However, the operators of such facilities will need periodic assistance in disease screening and some aspects of rearing and maintaining frogs. The Phoenix Zoo and Arizona Desert Museum (Museum) are possible sources of such assistance. These organizations could also assist by maintaining their own leopard frog propagation/holding facilities, subject to appropriate funding and their concurrence. In any case, cooperation will need to be maintained between the Service (especially the Refuge), and other program cooperators such as the AGFD, NMDGF, Phoenix Zoo, and Museum, to ensure that appropriate leopard frog propagation facilities are adequately funded and operated. Captive propagation must comply with the Service's policy regarding Controlled Propagation of Species Listed under the Act (65 FR 56916), as well as any other guidelines agreed upon by the Service.

2.5.10 Altered Circumstances

Altered circumstances are circumstances affecting a species or geographic area covered by the Agreement that can reasonably be anticipated by Malpai and the Service and that can be planned for (e.g., the listing of new species, or a fire or other natural catastrophic event in areas prone to such events). Administrators of this Agreement anticipate that five types of altered circumstances could occur within the covered area over the life of the Agreement:

(A). Drought. Droughts are a periodic phenomenon in the arid environments of Arizona and are almost certain to occur over the life of the Agreement. During drought, the Malpai (and other cooperators) and Participating Landowners will monitor leopard frog population sites and habitat conditions in the covered area according to the needs of the situation and will implement corrective measures on a case-by-case basis. Responses to actual or potential drought conditions will include, as necessary and appropriate: 1) improvements in water reliability at selected sites through water-hauling, well-drilling, deepening, and other means as described in section 2.5.5, paragraphs (E), (F), and (G); 2) salvage and relocation of leopard frogs from desiccated sites to other sites or temporary holding facilities; 3) re-establishment of extirpated populations when

drought conditions cease, as described in paragraph (D) below; and 4) other measures as appropriate.

(B). Invasion of leopard frog habitat by non-native predators. Colonization or inadvertent introduction of fish, bullfrogs, crayfish, or other predators into leopard frog habitat is also a significant possibility over the life of the Agreement. Bullfrogs and crayfish are of special concern, because they can migrate substantial distances over land under the right conditions and are present throughout both states. Bullfrogs and tiger salamanders are also of particular concern because they can carry chytridiomycosis. Preventing and detecting bullfrog, salamander, and crayfish colonization of leopard frog habitat is a key component of the Agreement's translocation criteria (section 2.5.3), required minimization measures (section 2.5.4), and monitoring program (section 2.5.6). Responses to predator colonization of leopard frog habitats within the covered area will be addressed by the Service and Participating Landowners on a case-by-case basis and will include, as necessary and appropriate: 1) removal of existing non-natives from new leopard frog population sites prior to translocation as described in section 2.5.3; 2) periodic control and removal of non-natives from leopard frog habitat using available means, including drying out affected tanks as described in section 2.5.4; 3) adjustment of the Agreement's conservation program to incorporate new scientific information concerning bullfrog movements, population dynamics, etc. as described in section 2.5.7; and 4) other measures as appropriate.

(C). Disease and pollution. The effects of disease and pollution on Chiricahua leopard frogs are poorly understood (65 *Federal Register* 37343; Rosen 1999). However, chytridiomycosis has been implicated in the disappearance of leopard frogs from some areas (65 *Federal Register* 37343), and ranid frog populations in southeastern Arizona are considered some of the most likely to be affected by airborne releases from copper smelters in northern Mexico (Blanchard and Stromberg 1987; Hale and Jarchow 1988). The Agreement's conservation program addresses the possibility of inadvertently transmitting disease into leopard frog populations as a result of translocations and livestock use (sections 2.5.3 and 2.5.9). If, however, disease or pollution becomes a problem despite such efforts, it is difficult to predict what effects these factors may have on leopard frog populations within the covered area or what measures might be undertaken to address them. The Service and Participating Landowners will therefore address such issues, should they arise, as dictated by the severity of the problem, funding availability, technical feasibility, and scientific standards accepted at the time.

(D). Extirpation of leopard frog populations. It is expected that leopard frog population sites within the covered area will, from time to time, disappear or be extirpated as a result of one or more of the above factors or other factors. To some extent, this would be consistent with the Agreement's metapopulation approach, especially for secondary population sites, but even in some cases, for primary sites. In any event, if and when previously extant leopard frog populations disappear (as determined by the Agreement's monitoring program), the Service and Participating Landowners will respond cooperatively as follows:

First, the cause will be determined if possible. At secondary sites, this may be a predictable seasonal pattern. At primary sites, the cause will likely be an adverse condition such as drought or invasion by non-native predators and will usually have been identified in advance and an attempt made to correct it. Second, an appropriate response will be determined. In the case of secondary sites in which no discernible problem has been identified, usually no action will be taken. In the case of primary sites and secondary sites in which a discernible problem has been identified, the decision whether or not to reestablish the leopard frog population will be made based on the

following factors: 1) the technical feasibility of correcting the problem and likelihood of successful reestablishment; 2) the biological importance of the population to its constituent metapopulation; and 3) funding availability to undertake corrective action and reestablish a new population.

(E). Emergency Maintenance. From time to time, aquatic habitat sites may be threatened via flash flooding and excessive sedimentation. Provisions have been included to provide for such contingencies (sections 2.5.4, paragraph (A)(ii) and 2.6.2, paragraph (A)(i)). The emergency situation or the resulting maintenance may result in the loss of the enrolled aquatic habitat or the population of Chiricahua leopard frogs at the specific site. The responsibility for restoration or maintenance of the stock tank would be that of the Participating Landowner, Participating Neighbor, or Participating State Agency; responsibility for responding to the loss of an established Chiricahua leopard frog population or degradation of habitat quality are not within the normal scope of ranching activities and would be addressed as discussed below by Malpai.

Responsibility for addressing altered circumstances. Generally, the responsibility for monitoring, evaluating, and correcting altered circumstances will not lie with the Participating Landowners. Exceptions to this would include altered circumstances that are specific to a landowner's property (e.g., the presence of bullfrogs in a particular stock tank) and associated corrective measures that are clearly identifiable and within the normal scope of ranching activities (e.g., drying out a stock tank to rid it of bullfrogs). A Participating Landowner may undertake such measures with appropriate notification to Malpai. Otherwise, the responsibility for implementing responses to altered circumstances deemed necessary by Malpai, in consultation with the Service, will lie with appropriate State and Federal agencies, academic institutions, and suitable conservation organizations as described in section 2.9.3.

2.6 Neighboring Landowner Protections

The parties to this Agreement recognize that some landowners who might otherwise wish to participate in the Agreement may nonetheless have significant concerns about the potential regulatory effects of such participation on their neighbors. Similarly, landowners who elect not to become active program participants, but who own property near or adjacent to landowners may have the same concerns. These concerns center primarily on the possibility that Chiricahua leopard frogs inhabiting a Participating Landowner's property could, through natural migration or dispersal, move onto aquatic sites, including stock tanks, on a neighboring property. In the absence of suitable regulatory protections, such neighboring landowners could then face certain legal liabilities under section 9 of the Act. Under such circumstances, non-participating landowners who neighbor Participating Landowners might even elect to move, alter, or destroy aquatic sites on their lands that are not occupied by leopard frogs in an effort to avoid future occupation by frogs—in effect, removing potential Chiricahua leopard frog habitat. By removing these disincentives, this section of the Agreement is expected to increase the benefits of the overall conservation program in two ways: 1) by potentially increasing enrollment in the Agreement by Participating Landowners (and thereby the number of actual leopard frog habitat sites); and 2) by helping increase the amount of potential habitat available on neighboring lands. Either way, Chiricahua leopard frogs will benefit as a result of regulatory protections for neighboring landowners.

2.6.1 Participating Neighbors

In addition to the Malpai, this Agreement may also encompass individual landowners whose ranches are within, or directly adjacent to the covered area and who are not Participating Landowners as defined in section 2.0 of the Agreement, but who own property near or adjacent to a Participating Landowner and are concerned about the potential regulatory effects due to their proximity to Chiricahua leopard frog populations on a Participating Landowner's property. Such landowners, while not active participants in the Agreement, may agree to more limited conservation measures than are required of active participants and thereby obtain certain regulatory assurances under the Agreement. For purposes of this Agreement, any such landowner is termed a "Participating Neighbor." After baseline conditions have been determined, any adjacent landowner may become a Participating Neighbor by agreeing to the conservation measures described in section 2.6.2 below and by obtaining a Certificate of Inclusion from the Malpai. The duration of a Certificate of Inclusion for a Participating Neighbor will be a minimum of 10 years, with 5-year review as described in section 2.5.4, paragraphs (E) and (F), and the same early termination provisions described in section 3.2. Thus, this Agreement, with its regulatory assurances, is also effective and binding on any Participating Neighbor as of the effective date of the Certificate of Inclusion issued by Malpai to the Participating Neighbor. Regulatory assurances provided to Participating Neighbors, through a Certificate of Inclusion, are effective for the duration of the enrollment in the Agreement plus one year, once the minimum conservation commitment of 10 years is completed. If a Participating Neighbor terminates his or her participation early, the assurances end with the termination of their participation in the agreement. Due to the assurance ending with the early termination of participation, coordination with Malpai and the Service must occur to determine a schedule to salvage frogs and bring the aquatic site(s) down to baseline prior to termination of participation (section 3.6 and 3.7).

2.6.2 Conservation Measures

There are two principal differences between the Agreement's conservation program as implemented by Participating Landowners and as implemented by Participating Neighbors. First, Participating Landowners will in some cases consent to the reestablishment or translocation of leopard frogs onto their lands, while leopard frogs would typically occupy a Participating Neighbor's lands only through natural

colonization and dispersal from adjoining properties. Second, Participating Landowners will typically consent to relatively intensive management of leopard frog populations on their lands by Agreement program cooperators (e.g., stock tank improvements, population manipulations, and biological monitoring). Participating Neighbors, however, will typically agree only to the relatively nominal conservation commitments as described below. In addition, participation in the Agreement by neighboring landowners would be most beneficial in providing assurances if they elected to enroll prior to Chiricahua leopard frogs actually colonizing their properties (zero baseline) from adjoining participating properties—although such landowners may enroll in the Agreement at any time.

If and when a neighboring landowner elects to participate in the Agreement, that Participating Neighbor shall be responsible for the following measures.

(A). Take Minimization Measures. To avoid unnecessary mortality of leopard frogs or deterioration of leopard frog habitat at aquatic sites on a Participating Neighbor's lands, including stock tanks that support Chiricahua leopard frogs, Participating Neighbors agree:

(i) Where practicable, to implement stock tank maintenance regimes, schedules, or techniques that maintain a portion of the tank as escape cover for resident frogs during maintenance activities; or, subject to the Participating Neighbor's consent (b) to grant access to appropriate (e.g., Service, AGFD, or NMDGF) personnel to collect and hold leopard frogs from the tank during tank maintenance operations and to return the frogs to the tank upon completion of maintenance activities, and, in this event, to provide 30 days notice to such personnel prior to commencement of maintenance operations. Maintenance resulting from an emergency situation will be defined and treated consistent with the same situations for a Participating Landowner, described in section 2.5.4, paragraph (A)(ii).

(ii) To manage livestock grazing in and around stock tanks supporting leopard frogs so as to avoid destruction or excessive deterioration of leopard frog habitat. This will include: 1) avoidance of excessive trampling in and around the tank, especially during frog breeding periods when egg masses are easily destroyed (i.e., March through April, September, and after heavy summer rains); 2) appropriate management of the numbers and seasonality of livestock use; and 3) any other appropriate measures to which the Participating Neighbor consents. All such measures must be compatible with necessary ranching operations.

(iii) To minimize or prevent the introduction of non-native aquatic predators into leopard frog habitat by: 1) committing not to knowingly engage in releases of bullfrogs, non-native predatory fish, crayfish, or tiger salamanders into occupied leopard frog habitat on participating properties and not to knowingly permit any other person or organization to engage in such releases on participating properties; 2) subject to the Participating Neighbor's discretion, reporting any observed occurrences of such species in leopard frog habitat on their properties to the Malpai; and 3) subject to the Participating Neighbor's consent, permitting access to ranch lands by appropriate (e.g., Service, AGFD, or NMDGF) personnel to implement control programs for these species. Note, however, that only measure 1) above is a requirement of the Agreement.

(B). Compliance monitoring. The Service, or any authorized representative of the Service, including Malpai where Malpai agrees to conduct such activities, will conduct compliance monitoring.

Specific requirements are a maximum of one visit per year (and a minimum of one visit per two years) to each leopard frog population site subject to this Agreement to verify that all required conservation commitments are being properly implemented. Prior to any such visit, Service monitoring personnel or representatives shall give notice to the Participating Neighbor of not less than 14 days prior to the visit and shall arrange the visit in a manner that is compatible with the landowner's schedule and needs. This monitoring requirement shall commence from the effective date of the Certificate of Inclusion for each affected Participating Neighbor. The parties to this Agreement understand that monitoring personnel will enter the Participating Neighbor's property solely to inspect stock tank and other aquatic sites on the participating property that are enrolled in the Agreement.

(C). Notification Requirements. By signature of this Agreement or associated Certificate of Inclusion, the Malpai or Participating Neighbor, as applicable, agrees: 1) to inform the Malpai whenever the Participating Neighbor has reason to believe that Chiricahua leopard frogs have or may have colonized any stock tank or other aquatic site on any property enrolled under the Agreement (if such site was not known at the time of enrollment); 2) to provide a minimum of 30 days notice to the Service or Malpai prior to: a) the retirement or removal of an enrolled stock tank supporting Chiricahua leopard frogs, or any other significant change in land-use activity at an enrolled site that would be expected to result in take of leopard frogs; and b) as described in section 3.3, the sale of any property owned by the Participating Neighbor and subject to the Agreement to any other party. The purpose of requiring notification for (C). 2). a). above is to provide the Service (or another program cooperator, as appropriate) with an opportunity to salvage leopard frogs from the site prior to disturbance of the tank and move them to another site. The purpose of requiring notification for (C). 2). b). above is to provide Malpai and the Service with an opportunity to discuss the Agreement with the new landowner, and, if appropriate, to enroll the new landowner in the Agreement. Participating Neighbors are also encouraged to provide the Malpai and the Service with 30 days notice whenever the landowner plans to conduct sediment removal activities at a tank or otherwise to dry out a tank; the purpose of this is to allow leopard frogs to be salvaged and either moved or returned to the tank, as appropriate.

(D). Development/Approval of Certificates of Inclusion. When any Malpai landowner is interested in enrolling lands under the regulatory assurances of the Agreement (i.e., is willing to become a Participating Neighbor), the procedures in section 2.5.4, paragraphs (F) and (G) shall be implemented.

2.6.3 Obligations of the Parties

Obligations of the parties to the Agreement with respect to these neighboring landowner provisions are as described in section 2.7 of the Agreement.

2.6.4 Understandings of the Parties

The parties to this Agreement understand, in the spirit of the Agreement, that Participating Neighbors will have reduced reason or incentive to manage stock tanks or other aquatic sites on participating properties in a fashion solely intended to prevent colonization of such sites by Chiricahua leopard frogs. The parties also understand that a Participating Neighbor may, subject to his or her sole discretion, increase or agree to increase conservation actions at leopard frog sites enrolled under the Agreement at any time.

2.6.5 Incidental Take Authorization

With respect to Participating Neighbors, this Agreement and its associated section 10(a)(1)(A) permit will authorize take exactly as described in section 2.9.2 of the Agreement with one important exception. That exception is that take that occurs as a result of any change to an enrolled aquatic site that supports leopard frogs from a customary ranching use to a non-ranching use (e.g., development of the site for non-ranching commercial purposes) is authorized under the Agreement with respect to Participating Neighbors. With respect to Participating Landowners, take that occurs as a result of conversion of an aquatic site supporting leopard frogs to another ranching purpose only is authorized under the Agreement.

2.7 Funding and Obligations of the Parties

Funding. Specific conservation activities that will require funding under this Agreement include, but are not limited to: 1) reestablishment or translocation of Chiricahua leopard frogs to stock tanks or other aquatic sites on participating properties within the covered area; 2) improvements in such sites necessary to provide suitable leopard frog habitat conditions (e.g., fencing); 3) ongoing management of new and existing leopard frog populations on participating properties to ensure their survival and that the Agreement's biological goals are being met; 4) monitoring; 5) captive propagation/holding of leopard frogs and maintenance of propagation facilities; 6) treatment of frogs and localities for chytridiomycosis**,** and 7) operation of the Malpai Conservation Committee.

The conservation program established by the Agreement is intended to be a collaborative process between the Service, Malpai, Participating Landowners, and other public and private cooperators. Accordingly, no single source will support the program's funding requirements. Instead, each cooperator will contribute funds, services, and other program needs according to its resources and role in the program. In addition, funds in the form of contracts, grants, and donations will be sought from program-related sources (i.e., program cooperators) as well as non-program related sources, such as conservation organizations and foundations. Possible funding sources to implement the conservation program include:

- Partners for Fish and Wildlife program (Service)
- Heritage Stewardship program (AGFD)
- Arizona Water Protection Fund (Arizona Department of Water Resources)
- Wildlife Habitat Incentive Program (Natural Resources Conservation Service)
- Heritage Grants Program (AGFD)
- Service Refuges Division
- North American Wetlands Conservation Act funds (Service)
- The National Fish and Wildlife Foundation
- Conservation organizations (e.g., The Nature Conservancy)
- Rancher organizations (e.g., Malpai Borderlands Group)

To some extent, the actual level of conservation effort implemented under this Agreement will depend on two factors: 1) the number of Malpai landowners who enroll in the Agreement; and 2) the success of its signatories and other program cooperators in providing or otherwise obtaining funding. For example, the number of leopard frog populations actually established and maintained in the covered area, the number of stock tank improvements actually implemented, and the level of monitoring required, would all depend on these factors. Thus, specific enrollment levels, funding levels, and funding needs over the long-term cannot be exactly predicted and to some extent will depend on each other. However, at a minimum, the Malpai and the Service expect the following. First, landowner participation, based on currently known interest levels, will likely be sufficient to protect existing leopard frog populations within the covered area and to establish a minimum of three to five additional populations through reestablishment and

translocation. Second, currently identifiable resources—including those available from the Malpai, the Service (Refuge), USGS-BRD, University of Arizona, Gray Ranch, The Nature Conservancy, AGFD, and NMDGF—are sufficient to support the program at this level. Beyond that, additional participation and funding would likely be needed. It is reasonable to expect that the Agreement program will gain momentum over time and that additional resources will be developed by program cooperators commensurate with increasing landowner interest, public and private interest generally, and evolving biological and funding needs.

The above notwithstanding, the parties to this Agreement understand that neither Malpai, the Service, any Participating Landowner, or any program cooperator under this Agreement can be compelled to provide financial assistance of any kind, except to the extent that such assistance is explicitly required under the Agreement, an executed Certificate of Inclusion, or any other legal instrument entered into by any such party or cooperator to the Agreement.

Obligations of the parties. Specific obligations of the Administrators of this Agreement and other program cooperators are as follows:

Malpai Borderlands Group shall:

(A). Hold the Agreement's associated section 10(a)(1)(A) permit on behalf of Participating Landowners, Participating Neighbors, and Participating State Agencies, as applicable; assist the Service in administering the Agreement; assist Participating Landowners, Neighbors, and State Agencies, as applicable, in enrolling in the Agreement; issue Certificates of Inclusion to Participating Landowners, Neighbors, and State Agencies, as appropriate; and, assist Participating Landowners, Neighbors, and State Agencies in processing amendments to the Agreement;

(B). Assist the Service and Participating Landowners, Participating Neighbors, and Participating State Agencies, as applicable, in determining baseline conditions for an affected property;

(C). Serve on the Malpai Conservation Committee;

(D). At its option, and when appropriate, accept funding of any or all types on behalf of the Agreement's conservation program and disperse such funds as necessary to support its conservation activities; and,

(E). Prepare annual reports, due annually on February 15, describing implementation of the Agreement in accordance with section 2.5.6, paragraph (E) of the Agreement.

The Service shall:

(A). Assist Malpai in administering the Agreement; approve enrollment of Participating Landowners, Participating Neighbors, and Participating State Agencies, as applicable, in accordance with section 2.5.4, paragraphs (G) and (H) of the Agreement; and, assist Malpai and Participating Landowners, Neighbors, and State Agencies in processing amendments to the Agreement, as appropriate;

(B). Assist the Malpai and Participating Landowners, Participating Neighbors, and Participating State Agencies, as applicable, in determining baseline conditions for a subject property;

(C). As described in section 2.10 of the Agreement, assist in salvaging leopard frogs from enrolled aquatic sites, including stock tanks, on Participating Landowner, Participating Neighbor, or Participating State Agency properties if and when the landowner elects to return the site to baseline conditions;

(D). Serve on the Malpai Conservation Committee;

(E). Assist in leopard frog propagation, reestablishment, translocation, disease testing and treatment, biological monitoring, and management as described in the Agreement or as otherwise mutually agreed to by the Malpai, the Service, and the Committee; and conduct appropriate coordination between its Ecological Services Division and Refuges Division, including the San Bernardino National Wildlife Refuge, as necessary to achieve this requirement; in particular, assist in salvaging leopard frogs from enrolled aquatic sites, including stock tanks, on Participating Landowner, Participating Neighbor, or Participating State Agency properties, as applicable, if and when the landowner elects to retire or remove an enrolled aquatic site;

(F). Conduct compliance monitoring in accordance with section 2.5.6, paragraph (A) and section 2.6.2, paragraph (B) of the Agreement;

(G). Provide funding for leopard frog conservation activities when appropriate, e.g., under the Partners for Fish and Wildlife program; and,

(H). Assuming approval of this Agreement, issue a permit to Malpai in accordance with section 10(a)(1)(A) of the Act and 50 CFR 17.32(d), with a 50-year term (section 3.6), that would provide Malpai and Participating Landowners, Participating Neighbors, and Participating State Agencies, as applicable, with authorization for incidental take of Chiricahua leopard frogs and provide regulatory assurances under the Act. The permit would authorize incidental take of Chiricahua leopard frogs as described in section 2.9.2 of the Agreement.

Participating Landowners shall:

(A). As their primary role, voluntarily provide leopard frog habitat sites on their lands, establish or maintain leopard frog populations at appropriate sites, and/or enhance suitable habitats, and to conduct their ranching operations consistently, maintaining that habitat as described in the Agreement and any associated Certificates of Inclusion, including monitoring the impacts of livestock use at enrolled stock tanks as described in section 2.5.6;

(B). Assist the Malpai and the Service in determining baseline conditions for their properties;

(C). Cooperate with the Malpai, the Service, and the Committee in developing specific conservation programs for their lands and assist Malpai in completing the Certificate of Inclusion (Appendix A) and Documentation of Participation Form (Appendix B or C, as applicable);

(D). Permit access to their lands by the Service or its authorized representative for purposes of compliance monitoring in accordance with section 2.5.6, paragraph (A) of the Agreement; and for purposes of biological monitoring by any personnel assigned or undertaking such duties under the authorities of the Agreement, as described in section 2.5.6, paragraphs (B) to (D);

(E). Serve on the Malpai Conservation Committee, as appropriate; and,

(F). In accordance with section 2.5.4, paragraph (E) of the Agreement, and except as otherwise provided in section 2.5.4, paragraph (E) and (F), section 3.2, or as otherwise provided for in the Participating Landowner's Certificate of Inclusion, maintain Chiricahua leopard frog population sites on enrolled lands for a minimum of ten years from the effective date of any applicable Certificate of Inclusion; and, implement: 1) at a minimum, applicable measures described in sections 2.5.5, 2.5.6, and 2.10 of the Agreement; and 2) subject to the Participating Landowner's consent, any additional measures agreed to in the Participating Landowner's Certificate of Inclusion, including, but not limited to, assistance in stock tank improvement projects.

Participating Neighbors shall:

(A). As their role, (section 2.6.1) conduct their ranching operations consistently with maintaining any Chiricahua leopard frogs that colonize or move onto their properties as described in section 2.6.2 of the Agreement;

(B). Assist the Malpai and the Service in determining baseline conditions for their properties;

(C). Permit access to their lands for purposes of compliance monitoring by the Service or its authorized representative(s), including Malpai, in accordance with section 2.6.2, paragraph (B) of the Agreement; and,

(D). In accordance with section 2.5.5, paragraph (E) of the Agreement—and except as otherwise provided in section 2.5.5, paragraph (E), or as otherwise provided for in the Participating Neighbor's Certificate of Inclusion—maintain Chiricahua leopard frog population sites at enrolled sites for the duration of their Certificates of Inclusion from the time leopard frogs are determined to be present, and implement: 1) at a minimum, applicable measures described in section 2.6.2 of the Agreement; and 2) subject to the Participating Neighbor's consent, any additional measures as agreed to in the Participating Neighbor's Certificate of Inclusion.

Participating State Agencies shall:

As described in section 3.1, State agency involvement in the Agreement would be triggered by enrollment under the Agreement of lands owned or administered by the State agency but leased for livestock grazing by a Malpai landowner. The primary obligations of Participating State Agencies in such cases, where the State agency actually becomes a signatory to a Certificate of Inclusion issued by Malpai, are to:

(A). Permit access to State lands by personnel of the Service, Malpai, other State and Federal agencies, academic institutions, and the lessee for the purpose of carrying out the Agreement's conservation activities, including, but not limited to, leopard frog reestablishment or translocation, monitoring, and stock tank improvement and management;

(B). As applicable, assist the Malpai and the Service in determining baseline conditions for their properties; and,

(C). Notify the Agreement's administrators (the Malpai and the Service) if State ownership of any State lands enrolled under the Agreement are to be sold or altered in any significant way, at least 30 days prior to such action.

Other Program Cooperators:

Other program cooperators, while not signatories to this Agreement, will participate in the program in a variety of ways, as detailed below. Other program cooperators include, but are not limited to, the AGFD; NMDGF; USGS-BRD; USFS and BLM, both of which manage Federal lands in and adjacent to the covered area; University of Arizona, Tucson; Phoenix Zoo; Arizona-Sonora Desert Museum; and The Nature Conservancy. Participation by these cooperators is entirely voluntary and is subject to their approval, budget and staff availability and existing agreements, if any. These cooperators shall:

(A). As requested by the Malpai and the Service, and subject to their discretion, serve on the Malpai Conservation Committee;

(B). Subject to their discretion, provide in-kind services (i.e., staff time, as available) to support conservation activities under the Agreement, including, but not limited to: 1) leopard frog management, reestablishment, and translocation activities; 2) biological monitoring activities; and, 3) operation of leopard frog propagation facilities;

(C). Subject to their discretion, provide funding for leopard frog conservation activities as appropriate and available from programs administered by the cooperator; and,

(D). Conduct other conservation activities as may be specified in any Cooperator Conservation Agreement (see Appendix D) entered into by the cooperator, Malpai, and the Service.

2.8 Expected Net Conservation Benefits

Under Service policy for Safe Harbor Agreements (USFWS 1999b), the Service may not enter into an Agreement unless it finds that the agreement will result in a "net conservation benefit" for the covered species. Moreover, under this policy the net conservation benefit must be sufficient to contribute, either directly or indirectly, to the recovery of the covered species.

This Agreement will result in numerous conservation benefits to the Chiricahua leopard frog. Generally, these will accrue as a result of establishment under the Agreement of a clear, well-defined conservation program across 83% (the non-Federal portion) of the 1,000,000-acre covered area. More specifically, the program will provide for management of existing leopard frog populations within the covered area, and for establishment of new populations through reestablishment and translocation, resulting in a net increase in leopard frog distribution and numbers throughout the covered area. It also will provide for improvements in leopard frog habitat quality and reliability through stock tank improvement projects, and for the application of accepted scientific principles—involving captive propagation and rearing, metapopulation dynamics, genetics, and disease treatment and prevention—in managing the program. In addition, the Agreement will provide for the flexibility needed to respond to special management challenges and evolving circumstances through its Adaptive Management program and changed circumstances provisions.

The Agreement is also likely to benefit Chiricahua leopard frogs in other, indirect ways. First, by addressing the regulatory concerns of non-Federal landowners in the covered area, the Agreement is expected to remove (or at least to reduce) the many obstacles that would otherwise exist to securing private landowner cooperation in management of leopard frogs on their lands. This is especially significant in light of the importance of privately owned lands and facilities (e.g., stock tanks) to leopard frog survival. In the absence of this cooperation, most of the Malpai covered area would likely not support leopard frogs at all, and the perpetuation of the few existing populations in the area would be uncertain. Furthermore, by demonstrating that livestock ranching and leopard frog management (i.e., that public and private objectives) can be compatibly integrated, this Agreement is likely to set an example

and precedent for possible future such agreements in areas near or adjacent to the covered area, as well as other areas throughout the leopard frog's range.

These benefits are expected to result in a net increase in Chiricahua leopard frog populations within the covered area. Although the exact magnitude of this increase is not known—since the exact number of Malpai landowners who actually enroll in the Agreement cannot be predicted—the increase is expected to be significant. At present, only a handful of leopard frog populations exist in the covered area. Based on interest in the Agreement by Malpai landowners as currently understood by the Malpai and the Service, the number of leopard frog populations in the covered area is likely to increase by a factor of two or three, at a minimum. Furthermore, although the period that Participating Landowners are required to maintain such populations is relatively short (10 years), Malpai and the Service anticipate that many such populations will be maintained indefinitely. This is because the conservation measures under the Agreement are specifically designed to be compatible with livestock ranching operations and because the associated regulatory assurances will help ensure continuing landowner cooperation. Consequently, it is expected that many Malpai landowners will maintain Chiricahua leopard frog populations on their lands so long as such maintenance is consistent with their ranching interests. This may even contribute indirectly to Chiricahua leopard frog population increases outside the covered area, since it may serve as a precedent or example for similar such agreements in areas near or adjacent to the covered area as well as other areas throughout the leopard frog's range.

In summary, this Safe Harbor Agreement is expected to result in a net conservation benefit to the Chiricahua leopard frog and to contribute substantially to the species' recovery by contributing to leopard frog population increases across a significant portion of the species' range (i.e., approximately one million acres) and by ensuring reliable management of such populations. Consequently, the Malpai and the Service believe that the terms satisfy Service regulatory requirements for approval of this Agreement.

2.9 Assurances Provided

2.9.1 Anticipated Incidental Take

Section 9 of the ESA and Federal regulation prohibits the "take" (i.e., killing, harming, or harassing) of federally listed fish and wildlife species without special exemption. The Chiricahua leopard frog is currently a federally listed Threatened species and is subject to the ESA's take prohibition, except as exempted under the 4(d) rule included in the decision to list this species. Any incidental take of leopard frogs on Participating Landowner, Participating Neighbor, or Participating State Agency properties, as applicable, that occurs as a result of the landowners' otherwise lawful activities (section 2.9.2) would be authorized by the "enhancement of survival permit" issued by the Service to Malpai in association with this Agreement, pursuant to section 10(a)(1)(A) of the Act. This permit will be issued at the time the Service approves the Agreement.

Incidental take of Chiricahua leopard frogs may occur under this Agreement primarily as a result of three activities: 1) livestock use of enrolled aquatic sites supporting leopard frog populations, or of other ranch properties; 2) aquatic site maintenance and improvement activities at enrolled aquatic sites; and 3) a decision by a Participating Landowner, Participating Neighbor, or Participating State Agency, as applicable, to return any enrolled site or sites on their properties to baseline conditions. As described in section 2.2, under the current listing of the Chiricahua leopard frog as a threatened species, activities listed in number 1) and 2) above are covered on non-federal lands by the 4(d) rule included in the final decision to list this species (65 *Federal Register* 37343). Take as defined in section 9 as a result of these activities is authorized under the 4(d) rule, unless the Chiricahua leopard frog were reclassified to endangered or the 4(d) rule is invalidated. The discussion of take that follows is in light of the possibility

of a reclassification to endangered or a court-ordered invalidation of the 4(d) rule, and thus take as a result of these activities is part of the assurances of this agreement. Typical ways in which leopard frogs might be taken during these activities is described in this section, section 1.1, and section 2.9.2 of the Agreement. Section 2.5.4 describes the measures that will be undertaken under this Agreement to minimize take of leopard frogs during these activities. Except with respect to 3) above, these measures are designed specifically to ensure that leopard frog populations inhabiting affected stock tanks and other sites continue to survive. This Agreement and the associated section 10(a)(1)(A) permit does not authorize deliberate direct take of Chiricahua leopard frogs, e.g. capture, collection, or hunting.

The actual levels of incidental take of leopard frogs that will occur under the Agreement are difficult to determine. This is because specific leopard frog population levels at any given time, both throughout the covered area and within individual sites enrolled in the Agreement, are unknown, as are the specific degrees to which Participating Landowners will undertake activities that result in incidental take. In particular, it is unclear how many Participating Landowners will elect to return lands enrolled under the Agreement to their baseline conditions over the life of the Agreement. The Malpai and Service believe, in most cases, that Participating Landowners will not elect to return enrolled lands to baseline conditions, since stock tanks and other aquatic sites are essential features to livestock ranching, which is the primary land use activity occurring in the covered area, and because the conservation measures are designed to be compatible with livestock ranching. Typically, a Participating Landowner would be expected to return enrolled aquatic sites to baseline conditions only in the event that such sites were needed for another ranching purpose (e.g., a stock tank needs to be moved to another location, or a tank site is needed for another ranching use). In any case, the conservation benefits to Chiricahua leopard frogs anticipated as a result of Agreement are expected to more than balance the relatively minimal levels of take anticipated as a result of the activities described above.

2.9.2 Take Authorized

This Agreement and its associated section 10(a)(1)(A) permit will authorize take of leopard frogs as a result of the following specific landowner activities: 1) "routine" stock tank repair and maintenance as described in section 2.5.4, paragraph (A)(i) or "emergency" stock tank repair and maintenance as described in section 2.5.4, paragraph (A)(ii); 2) construction of any stock tank improvement projects or facilities needed for frog management purposes and specifically described in the landowner's Certificate of Inclusion, including fences, pipelines, or road segments immediately associated with such projects; 3) capture, translocation, and/or temporary holding of leopard frogs during tank maintenance and improvement activities, if necessary to minimize mortality or injury to frogs; 4) livestock grazing and use either in the immediate vicinity of any stock tanks that support leopard frogs (e.g., resulting in destruction of egg masses or tadpoles) or at other ranch locations (e.g., resulting in take of migrating frogs); 5) livestock grazing and use where such use results in take of leopard frogs as a result of inadvertent disease transmission, so long as the landowner has undertaken necessary measures to minimize such take as described in section 2.5.4, paragraph (A) and 2.5.10, paragraph (C); 6) take associated with the retirement or removal of a stock tank, if such eventuality is needed for ranch management purposes; 7) any normal day-to-day ranch management activity, such as operation of cars and trucks, if such activities result in occasional and inadvertent takings of frogs moving across roads or other ranch properties; and 8) returning of an enrolled property to baseline condition. These take authorizations are contingent on adequate implementation of all commitments required by this Agreement. The Agreement and associated permit, if approved, does not authorize take of leopard frogs that might occur as a result of prescribed burns, construction of roads or other ranch facilities not associated with specific leopard frog conservation projects or actions, and activities resulting in a change to a leopard frog population site from a customary ranching use to a non-ranching use (e.g., development of the site for non-ranching commercial purposes), except as provided for Participating Neighbors (section 2.6.5). The Agreement does not authorize take

below the established baseline for any activity. Incidental take authority below established baseline for a property would need to be obtained through another ESA permitting process such as a Habitat Conservation Plan under section 10(a)(1)(B) of the ESA.

2.9.3 Assurances Provided in Case of Altered Circumstances

Through this Agreement, the Service provides the Malpai, Participating Landowners, Participating Neighbors, and Participating State Agencies with the following assurances that no additional conservation measures, nor additional land, water, or resource use restrictions, beyond those voluntarily agreed to, will be required for Chiricahua leopard frog populations covered by this Agreement. These assurances apply to the Malpai, Participating Landowners, Neighbors, and State Agencies only where the Agreement and any associated Certificate of Inclusion are being properly implemented. The assurances also apply only with respect to the Chiricahua leopard frog.

If additional conservation and mitigation measures are deemed necessary, the Service may require additional measures of the Malpai, Participating Landowner, Participating Neighbor, or Participating State Agency, as applicable, but only if such measures are limited to modifications within the conservation habitat areas, if any, for the affected species and maintain the original terms of the Safe Harbor Agreement. However, where additional conservation measures might need to be implemented by Participating Landowners, Neighbors, or State Agencies, the parties to this Agreement also recognize, in the spirit of the Agreement, that any such measures would be developed jointly and cooperatively by the Malpai, the Service, and the affected landowner or landowners. Additional conservation measures will not involve the commitment of additional land, water, or financial compensation or additional restrictions on the use of land, water, or other natural resources otherwise available for development or use under the original terms of the Agreement without the consent of the Malpai, Participating Landowner, Participating Neighbor, or Participating State Agency, as applicable.

2.10 Notification Requirements

By signature of this Agreement or associated Certificate of Inclusion, the Malpai, Participating Landowner, Participating Neighbor, or Participating State Agency, as applicable, agrees to provide a minimum of 30 days notice to the Service prior to any of the following actions: 1) stock tank maintenance activities, especially involving sediment removal, at any tank site that supports leopard frogs; 2) the deliberate drying out of a stock tank that supports leopard frogs, either in preparation for maintenance activities or for any other reason; 3) the retirement or removal of a stock tank that supports leopard frogs; and, 4) as described in section 3.3 of the Agreement, the sale or transfer of any property owned by the Participating Landowner, Participating Neighbor, or Participating State Agency, as applicable, and subject to the Agreement to any other party. The purpose of requiring notification for 1), 2), and 3) above is to provide the Service (or another program cooperator, as appropriate) with an opportunity to salvage leopard frogs from the site prior to disturbance or removal of the tank and either return them to the site or move them to a new site. Similarly, Participating Landowners are encouraged to alert the Malpai and the Service if any aquatic site on their lands that supports leopard frogs is in danger of drying out as a result of drought or other conditions. The purpose of requiring notification for 4) above is to provide the Service with an opportunity to discuss the Agreement with the new landowner and, if appropriate, to enroll the new landowner in the Agreement. Under the Agreement, the Malpai and Participating Landowners also agree to the notification requirements described in sections 2.5.4, paragraph (A)(i) and (ii), 2.62, paragraph (C), and 2.7.

3.0 ADMINISTRATIVE PROCEDURES

This section describes various administrative procedures under the Agreement, such as amendment of its associated permit, permit termination and duration, and involvement in the Agreement by State agencies.

3.1 State Agency Participation

At least two State agencies, the ASLD and NMSLO, own lands in the covered area and administer grazing leases for these lands held by other Malpai landowners. Thus, cooperation in this Agreement by State agencies, primarily ASLD and NMSLO, will be desirable to the extent that any stock tanks used by Malpai ranchers and enrolled under the Agreement occur on State lands. Obligations incurred under this Agreement by landowners primarily involve appropriate management of livestock tanks supporting leopard frogs, appropriate management of livestock use at such tanks, and notification requirements. Since these types of obligations primarily involve livestock operations *per se*, most obligations under the Agreement in cases where State-leased lands are enrolled under the program will be borne by the lessee rather than the administering State agency (e.g., ASLD or NMSLO). Nevertheless, certain commitments by the State agency in such cases may also be needed, primarily: (A) the grant of permission to personnel of the Malpai, the Service, other State and Federal agencies, academic institutions, and the lessee to enter State lands to carry out the conservation program; and (B) notification to the Agreement's Administrators if State ownership of State lands enrolled under the Agreement are to be sold or altered significantly.

Consequently, the parties to this Agreement (the Service, Malpai, and Participating Landowners or Participating Neighbors, as applicable) shall make every reasonable effort to contact any affected State agency when State-lease lands are being considered for enrollment in the Agreement, and to include the agency in any discussions concerning such enrollment and concerning commitments associated with such enrollment. Furthermore, where State-leased lands are to be enrolled in the Agreement, the affected agency or agencies should be encouraged to formally enter into the Agreement by becoming a signatory to any Certificate of Inclusion issued by Malpai to the landowner utilizing the State-leased lands (see Appendices A, B, and C). By becoming a signatory to the Certificate, a State agency would become a Participating State Agency as described in section 2.0 of the Agreement. Those goals notwithstanding, however, the parties to this Agreement understand that no obligation of any kind is imposed on any State agency by entry into this Agreement by the Malpai and the Service. As with all Malpai landowners, participation in this Agreement by State agencies is entirely voluntary.

3.2 Permit and Agreement Amendments or Termination

Amendments to the Agreement. The Service, Malpai, or a Participating Landowner, Participating Neighbor, or Participating State Agency may, from time to time, elect to amend this Agreement (for a Participating Landowner, Neighbor, or State Agency this would mean amending the associated Certificate of Inclusion). Any party to the Agreement may propose amendments by providing written notice to the other parties explaining the proposed amendment and the reasons for the amendment. However, approval of an amendment will require the written consent of all parties and must be consistent with the assurances described in section 2.9.3 of the Agreement. Any proposed amendment to the Agreement or an associated Certificate of Inclusion will be considered effective as of the date that Malpai, the Service, and any and all affected Participating Landowners, Neighbors, or State Agencies have agreed in writing to the amendment.

Amendments to the permit. The Malpai's section 10(a)(1)(A) permit may be amended in accordance with all applicable legal requirements in force at the time of the amendment, including, but not limited to, the Act, National Environmental Policy Act, and Service permit regulations (currently these are codified in

50 CFR, Parts 13 and 17). Amendment of the permit would require, at a minimum: (A) a written explanation of why the amendment is needed; (B) an explanation of what, if any, effects the amendment would have on the Chiricahua leopard frog; and (C) a *Federal Register* notice of the proposed amendment and 30-day public comment period.

Minor or Administrative Amendments. Minor or Administrative Amendments involve routine administrative revisions, changes to the operation and management program, or minor changes to the Agreement, which do not affect take provisions of the Agreement. Such minor amendments do not materially alter the management actions or the terms of the section 10(a)(1)(A) Enhancement of Survival Permit associated with this Agreement.

Upon written request of the Malpai, the Service is authorized to approve minor amendments to this Agreement, if the amendment does not conflict with the primary purpose of this Agreement as stated in sections 1.1 and 2.1 herein.

Early termination of conservation commitments. The parties to this Agreement recognize that a Participating Landowner, Participating Neighbor, or Participating State Agency, as applicable, may occasionally face emergency or exigent circumstances that result in the need for the landowner to terminate his or her conservation commitments under the Agreement prior to completion of the required conservation period. A Participating Landowner, Neighbor, or State Agency who needs to terminate enrollment in the Agreement may therefore do so by giving Malpai and the Service written notice of such termination and a written explanation of the reason for termination at least 60 days prior to the effective date of the termination. Upon such notification, any party to the Agreement may request a meeting of all affected parties to discuss pertinent or final issues, if any, that may be raised by the landowner's termination announcement; all parties to the Agreement will honor any such request within the 60-day notification period. The Agreement and Certificate of Inclusion with respect to that Participating Landowner, Neighbor, or State Agency will then be considered terminated as of the end of the 60-day period, provided that all obligations of the landowner requesting termination have been satisfied (as described in the last paragraph of this section). However, the parties to this Agreement understand that these early termination provisions are intended to address emergency or exigent circumstances only. For less urgent circumstances the five-year review process described in section 2.5.4, paragraph (F) of the Agreement must be used to terminate a landowner's conservation commitments prior to the end of the required conservation period. If the Agreement and any associated Certificate of Inclusion applies to more than one leopard frog population site on the affected property, early termination may be specific to one or more sites while others remain subject to the Agreement. In this case, however, the notice of early termination must specify the sites to which the request refers.

Voluntary termination of the permit. This Agreement and its associated section 10(a)(1)(A) permit may be terminated at any time by the Malpai or the Service acting jointly or unilaterally, if, in the view of either or both parties, the Agreement and its permit are no longer necessary, desirable, or applicable. The Malpai or the Service may terminate the permit by providing written notice to the other party of its intention to terminate the permit and a written explanation of the reason for termination; such notice shall be provided not less than 90 days prior to the effective date of termination. Upon such notification, either party to the Agreement may request a meeting of both parties to discuss pertinent or final issues, if any, that may be raised by the termination announcement; each party to the Agreement will honor any such request within the 90-day notification period. The Agreement and its associated section 10(a)(1)(A) permit will then be considered terminated as of the end of the 90-day period, provided that all obligations of the party requesting termination have been satisfied (as described in the next paragraph). In addition, the party requesting termination of the Agreement will, within 60 days of the effective date of termination, notify all Participating Landowners, Participating Neighbors, and Participating State

Agencies who are party to the Agreement through active Certificates of Inclusion of the pending termination. Note, however, that the provisions of this paragraph apply only to voluntary termination of the permit. Procedures for suspension or revocation of the permit by the Service for any failure of the Malpai or a Participating Landowner, Participating Neighbor, or Participating State Agency to implement the terms of the Agreement or permit are addressed in section 3.5.

Requirements for early or voluntary termination. The parties to this Agreement understand that early or voluntary termination of the Agreement or its associated section 10(a)(1)(A) permit as described above is allowable only if the party requesting termination has satisfied all conservation commitments required by the Agreement, any associated Certificate of Inclusion, and the terms and conditions of the permit as of the effective date of termination of the Agreement or Certificate, as applicable. Furthermore, any party to the Agreement requesting early or voluntary termination understands that the benefits enjoyed by that party under the Agreement—regulatory or otherwise—also cease as of the effective date of termination.

Note that early or voluntary termination sections do not supercede any agreements established as part of funding arrangements for conservation related activities. In addition, any return to baseline must be made prior to the effective date of termination and should be coordinated between the landowner, Malpai, and the Service to allow time to salvage frogs from sites prior to returning them to baseline.

3.3 Transfer of Benefits

By signature of this Agreement or associated Certificate of Inclusion, the Malpai or Participating Landowner, Participating Neighbor, or Participating State Agency, as applicable, agrees to notify the Service if ownership of a property covered by the Agreement is to be transferred to another landowner. This notification shall be provided at least 30 days in advance of any such transfer. If a Participating Landowner, Neighbor, or State Agency transfers ownership of the affected property, the Service will regard the new property owner as having the same rights and obligations as the original property owner if the new owner agrees to become a party to the original Agreement. Actions taken by the new Participating Landowner, Neighbor, or State Agency that result in take of Chiricahua leopard frogs would be authorized if the new Participating Landowner, Neighbor, or State Agency maintains the terms and conditions of the original Agreement. If the new property owner does not become a party to the Agreement, the new property owner would neither incur responsibilities under the Agreement nor receive any assurances relative to restrictions under section 9 of the Act that might result from listing of the Chiricahua leopard frog. After any notification of change in ownership, the Service will contact the new or prospective property owner to explain the Agreement and to determine whether the new property owner would like to continue the original Agreement or enter into a new Agreement. When a new property owner continues an existing Agreement, the Service will honor the terms and conditions of the original Agreement.

3.4 Permit Severability

Each Certificate of Inclusion issued by the Malpai to a Participating Landowner, Participating Neighbor, or Participating State Agency will be severable with respect to the Malpai's section 10(a)(1)(A) permit, and with respect to Certificates of Inclusion issued by Malpai to other Participating Landowners, Neighbors, or State Agencies. Thus, failure on the part of one landowner may result in revocation of that landowner's Certificate, but shall not affect the rights and obligations of other landowners under their respective Certificates. Nor will it affect Malpai's permit, provided that Malpai is itself otherwise in compliance with all terms and conditions of the permit and the Agreement.

3.5 Permit Suspension and Revocation

A landowner's Certificate of Inclusion may be suspended or revoked by either Malpai or the Service, acting jointly or separately, but only if: (A) the landowner has failed to satisfy a specific conservation commitment or commitments for which he or she is responsible; (B) the Service and Malpai have made reasonable, good faith efforts to cooperatively work with the landowner to correct the deficiency; (C) the deficiency remains uncorrected, even after Malpai's and the Service's good faith efforts; and (D) written notice has been provided to the affected landowner alerting the landowner of the pending suspension or revocation a minimum of 30 days prior to the effective date of the suspension or termination. Similarly, the Service may suspend or revoke Malpai's section 10(a)(1)(A) permit for cause in accordance with currently applicable Federal regulation (50 CFR Parts 13 and 17), or with any laws and regulations in force at the time of such suspension or revocation. Any such suspension or revocation must, however, be consistent with the regulatory assurances described in section 2.9 of the Agreement.

3.6 Duration of Permit and Assurances

This Agreement and its associated section 10(a)(1)(A) permit will run for a 50-year term from their effective dates. This means that the section 10(a)(1)(A) permit will expire in 50 years, so long as the parties to the Agreement (Malpai and the Service) continue to implement the Agreement's provisions through mutual consent and so long as neither party terminates the Agreement under its voluntary termination procedures (as described in section 3.2) or permit revocation procedures (as described in section 3.5).

The authorities and assurances of the section 10(a)(1)(A) permit will apply to Malpai from the effective date of the permit and will last so long as the permit remains in effect. For a Participating Landowner, the authorities and assurances of the permit will apply from the effective date of his or her Certificate of Inclusion until 1) the end of the required conservation period, plus two years as described in section 2.5.4, paragraph (D) to make arrangements with Malpai and the Service to return any enrolled sites back to baseline conditions; or 2) so long as the Certificate of Inclusion is renewed and remains in effect (in the case of a landowner who continues indefinitely to implement his or her conservation commitments beyond the required conservation period). Participating Neighbors will receive regulatory assurances from the effective date of his or her Certificate of Inclusion to the termination of their participation in the Agreement. If a the required conservation period of 10 years has been met, the Participation Neighbor will have one year of assurance in which to bring the enrolled sites back to baseline or renew participation in the Agreement. Since early termination results in the loss of assurance on the date of termination, prior to arrangements shall be made with Malpai and the Service to return any enrolled sites back to baseline condition before the termination date. This will provide an opportunity to salvage any Chiricahua leopard frogs from such a site. Assurances for Participating State Agencies will be similar to that of a Participating Landowner or Participating Neighbor depending on the conservation commitment agreed to in the Certificate of Inclusion. Assurances will be documented on the Certificate of Inclusion on a case-by-case basis for Participating State Agencies.

A Participating Landowner, Participating Neighbor, or Participating State Agency that terminates their participation in the Agreement by, opting out of participation at the 5-year review, or opting out due to emergency or exigent circumstances will lose the assurances provided through this program immediately upon termination of participation, unless an extension has been granted to allow for salvage of frogs from a site. Therefore prior to termination of participation, any participant who seeks to return enrolled properties back to baseline condition should make arrangements through Malpai and the Service or authorized cooperators to deal with any Chiricahua leopard frog populations that may be impacted. The Service, Malpai, or other authorized cooperator shall not be able to unnecessarily delay or stop a

landowner from early termination of participation, unless returning a site to baseline will jeopardize the continued existence of the species. If such a situation should occur, this would constitute an altered circumstance and the participant, the Service, and Malpai shall work together to resolve the needs of the participant to terminate participation and the needs of the species.

3.7 Permit Renewal and Certificate Renewal

This Agreement and the associated Section 10(a)(1)(A) permit will expire in 50 years. However, if the need still exists, this permit maybe renewed or extended. As assurances for Participating Landowners, Participating Neighbors, and Participating State Agencies can only be given for the period that the Section 10(a)(1)(A) permit is valid, no Certificates of Inclusion shall be issued with assurances past the expiration date of the permit. An extension or renewal of the Agreement and associated section 10(a)(1)(A) permit must be in place prior to any assurances being given that last past the duration of the original permit. If the Section 10(a)(1)(A) permit is extended or renewed, the baseline established on any participant's property that has a valid Certificate of Inclusion shall be carried forward with the renewal or extension of the permit. Permit extension can only occur for a maximum of 2 years at a time, up to a maximum of 6 total years. Permit renewal will be accomplished through the development of a new Agreement and the issuance of a new Section 10(a)(1)(A) permit. Any extensions or renewals will recognize the original baselines for enrolled sites that have valid Certificates of Inclusion being properly implemented at the time of the extension or renewal.

Certificates of Inclusion may be renewed on a continuing basis throughout the life of the permit as long as the period of assurance does not extend past the expiration date of the Section 10(a)(1)(A) permit. Participating Landowners may renew their Certificate of Inclusion with the original baseline determination after the conservation period agreed to on the Certificate of Inclusion has been met and prior to the end of the 2-year period of assurances, provided the minimum 10-year required conservation period has been met, the enrolled sites have not been returned to baseline conditions, monitoring has continued, and all conservation enhancements are still in place. If the 2-year period of assurances has elapsed, a new baseline determination must be made and a new Certificate of Inclusion needs to be agreed upon. Participating Neighbors may renew their Certificate of Inclusion with the original baseline determination after the conservation period agreed to on the Certificate of Inclusion has been met and prior to the end of the 1-year period of assurances, provided the minimum 10-year required conservation period has been met, the enrolled sites have not been returned to baseline conditions, monitoring has continued, and all conservation enhancements are still in place. If the 1-year period of assurances has elapsed, a new baseline determination must be made and a new Certificate of Inclusion needs to be agreed upon. A Participating State Agency may renew their Certificate of Inclusion similar to Participating prior to the expiration date of the existing certificate to 1) maintain continuous assurances for their properties and 2) maintain the original baseline. In practice, a 60-day grace period will exist for both Participating Landowners and Neighbors provided the enrolled sites have not been returned to baseline condition and no detrimental alterations have occurred to enrolled sites. Any Participant that has met the initial 10-year required conservation period and renews their certificate of inclusion will not have an additional required conservation period required to get the 2-year or 1 year of assurances past termination of participation for Participating Landowners and Participating Neighbors, respectively. Provided that the renewal is with the original baseline. If the participant allows his Certificate of Inclusion to laps and goes beyond the period of assurances, or at any time takes the property back to baseline, any new Certificate of Inclusion will have to have a new baseline determination and a new 10-year required conservation period.

3.8 Permit Transfer and Succession

Although not anticipated, in the event that Malpai should cease operations or otherwise be unable to carry out its responsibilities as permittee under this Agreement, the Malpai's section 10(a)(1)(A) permit may be transferred to another entity. Transfer or succession of the permit would be in accordance Federal regulations applicable or in force at the time of the transfer (at present these are codified at 50 CFR 13.24 and 13.25). Although a permit successor is not contemplated or named in this Agreement, an appropriate permit successor in the event of a transfer could generally include a suitable State agency or conservation organization. In the event of a transfer of the permit all Participating Landowners, Participating Neighbors, and Participating State Agencies will be notified, and they may elect to terminate their Certificates of Inclusion if they wish to at that time.

3.9 Coordination With 4(d) Rule

In its final rule to list the Chiricahua leopard frog under the Act, the Service included a rule under section 4(d) of the Act that authorizes take of Chiricahua leopard frogs as a result of livestock use of or maintenance activities at livestock tanks located on private or tribal lands (67 *Federal Register* 40790). This rule and the section 10(a)(1)(A) permit issued in association with this Agreement could result in redundant, overlapping, or contradictory take authorities. Should this occur, the parties to the Agreement intend that the section 10(a)(1)(A) permit will govern with respect to authorized activities (sections 2.5.4, 2.5.5, 2.6, and 2.9) within the Agreement's covered area.

3.10 Recovery of Species

The goal of the Act, and the various policies and programs implemented under the Act, is the recovery of species that are listed as threatened or endangered. Therefore, the intent of this Agreement is to make a contribution towards recovery and delisting of the Chiricahua leopard frog. If the Chiricahua leopard frog is delisted during the term of the section 10(a)(1)(A) permit, the Service would encourage Malpai and the Agreement participants to maintain their conservation efforts for 5 years after the final rule to delist the Chiricahua leopard frog is published. This 5-year period is consistent with the requirement for monitoring of species removed from the endangered species list as stated in section 4(g)(1). Maintaining the conservation and monitoring efforts of the Agreement would be voluntary on the part of Malpai and the agreement participants.

3.11 Legal Recitations

Remedies. Each party to this Agreement shall have all remedies otherwise available to enforce the terms of the Agreement and the permit, except that no party shall be liable in damages for any breach of the Agreement, any performance or failure to perform an obligation under the Agreement, or any other cause of action arising from the Agreement.

Availability of appropriated funds. Implementation of this Agreement is subject to the requirements of the Anti-Deficiency Act and the availability of appropriated funds. Nothing in this Agreement will be construed by the parties to require the obligation, appropriation, or expenditure of any money from the U.S. Treasury. The parties acknowledge that the Service will not be required under this Agreement to expend any Service appropriated funds unless and until an authorized official of that agency affirmatively acts to commit such expenditures as evidenced in writing.

Third party beneficiaries. This Agreement does not create any new right or interest in any member of the public as a third-party beneficiary, nor shall it authorize anyone not a party to the Agreement to maintain a suit for personal injuries or damages pursuant to the provisions of the Agreement. The duties,

obligations, and responsibilities of the parties to the Agreement with respect to third parties shall remain as imposed under existing law.

Compliance with Federal law. The terms of this Agreement shall be governed by and construed in accordance with applicable Federal law. Nothing in the Agreement is intended to limit the authority of the Service to fulfill its responsibilities under Federal law. All activities undertaken pursuant to the Agreement or the permit must be in accordance with all applicable State and Federal laws and regulations.

Notices/reports. Any notices or reports required by this Agreement shall be delivered in writing to the Administrators of the Agreement as listed in section 2.0 and section 3.0 of the Agreement.

3.11 Signatories

IN WITNESS WHEREOF, THE PARTIES HERETO have executed this Safe Harbor Agreement to be in effect as of the date last signed below.

BY_____ Date_____
Executive Director
Malpai Borderlands Group
Douglas, Arizona

BY_____ Date_____
Regional Director
U.S. Fish and Wildlife Service
Albuquerque, New Mexico

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Appendix A

Certificate of Inclusion

In The
Safe Harbor Agreement
For the Chiricahua Leopard Frog (*Rana chiricahuensis*)
Between the Malpai Borderlands Group and U.S. Fish and Wildlife Service

This certifies that the Participating Landowner, Participating Neighbor, or Participating State Agency, as applicable, who owns or administers property described in the attached Documentation of Participation Form, is included within the scope of Permit No. [**insert no.**], issued by the U.S. Fish and Wildlife Service on [**insert date**] to the Malpai Borderlands Group (Malpai) under the authority of section 10(a)(1)(A) of the Endangered Species Act of 1973, as amended, 16 U.S.C. 15389(a)(1)(A). Pursuant to that permit and this Certificate, the Participating Landowner, Participating Neighbor, or Participating State Agency, as defined in sections 2.0, 2.6.1, and 3.1 respectively, of Malpai's Safe Harbor Agreement (or Agreement), is authorized to cause incidental take of Chiricahua leopard frogs during the course of ranch management activities described in section 2.9.2, and section 2.6.5 of the Agreement on the specific lands identified in the Documentation of Participation Form. Such permit authorization is subject to the carrying out of conservation measures described in the Documentation of Participating Form, the terms and conditions of the permit, and the terms and conditions of the Agreement entered into pursuant thereto by the Malpai Borderland Group and the U.S. Fish and Wildlife Service. By signing this Certificate of Inclusion, the Participating Landowner, Participating Neighbor, or Participating State Agency, as applicable, agrees to carry out all assigned conservation measures as described in the attached Documentation of Participation Form for a period of **[insert no. of years Certificate is in effect]** years.

_____ _____
Executive Director — Date
Malpai Borderlands Group

_____ _____
Participating Landowner/Neighbor [**insert which**] — Date

_____ _____
Participating State Agency — Date
[**Name agency, person signing, title**]

_____ _____
Concurrence, U.S. Fish & Wildlife Service — Date
Field Supervisor, Arizona Ecological Services Office, Phoenix

Appendix B

Documentation of Participation Form
For Safe Harbor Agreement with Assurances

This form documents the specific conservation commitments and enrolled lands involved for the Safe Harbor Agreement (Agreement) entered into with the Malpai Borderlands Group and Service by the Participating Landowner, Participating Neighbor, or Participating State Agency, as applicable, named on Lines B & C. Fill in the form using footnote directions. Use additional sheets, if necessary. When completed, attach the form to the Certificate of Inclusion of which it is a part, together with any maps and additional sheets used.

A. Type of Participant(s)[1]: Participating Landowner ____
Participating Neighbor ____
Participating State Agency ____

B. Participating Landowner's/Neighbor's Name and Address: _____
_____

C. Participating State Agency's Name and Address: _____
_____

D. Legal Description or Map Showing Baseline Conditions (if any) & Enrolled Lands_____
_____

E. Conservation Commitments[2] _____
_____
_____

F. Required Conservation Period[3] _____

G. Ending Date or Conservation Period _____

_____ _____
Executive Director Date
Malpai Borderlands Group

_____ _____
Participating Landowner/Neighbor **[Specify which]** Date

_____ _____
Participating State Agency Date
[**Name agency, person signing, title**]

[1] Check as applicable. If joint Certificate of Inclusion for a Participating Landowner/Neighbor and a Participating State Agency, check both.
[2]On Line E, specify any conservation commitments to be implemented by each participant indicated in Lines B & C in addition to the measures described in these sections. Include leopard frog reestablishments/translocations, if any, allowed on enrolled lands; what, if any, conservation options as described in section 2.5.5 of the Agreement will be implemented; and any funding commitments.
[3] Specify the number of years the conservation commitments described on Line E will be maintained or carried out (10-year minimum).

Appendix C

Cooperator Agreement for Chiricahua Leopard Frog

By and Between
the U.S. Fish and Wildlife Service, Malpai Borderlands Group,
and [insert name of agency or organization]

Pursuant to the Safe Harbor Agreement
Between the U.S. Fish and Wildlife Service and Malpai Borderlands Group

This Cooperator Agreement for Chiricahua Leopard Frog ("Cooperative") is made and entered into by and among the U.S. Fish and Wildlife Service, hereinafter called the Service, Malpai Borderlands Group, hereinafter called Malpai, and [enter name of agency and organization], hereinafter called [enter abbreviation or acronym], to establish a basis for cooperation among these agencies and organizations in implementation of the Safe Harbor Agreement, entered into between the Service and Malpai on [enter date] for the conservation of the Chiricahua leopard frog (*Rana chiricahuensis*) in the Malpai Borderlands area of southeastern Arizona and southwestern New Mexico.

WITNESSETH

WHEREAS, the Chiricahua leopard frog, as of the effective date of the Safe Harbor Agreement is a species listed under the Federal Endangered Species Act of 1973, as amended (Act); and,

WHEREAS, the Service and Malpai have entered into the Safe Harbor Agreement pursuant to the authorities of section 10(a)(1)(A) of the Act and associated Service policy and Federal regulation to establish a conservation program for the Chiricahua leopard frog in the Malpai Borderlands area and to provide for regulatory assurances to non-Federal landowners who own lands in the Malpai Borderlands area and who enter into the Safe Harbor Agreement with the Service and Malpai; and,

WHEREAS, the Service and Malpai are signatories to the Safe Harbor Agreement, while individual non-Federal landowners within the Malpai Borderlands area may participate in the Safe Harbor Agreement's conservation program and receive its regulatory assurances through a Certificate of Inclusion issued by Malpai to the participating landowner; and,

WHEREAS, the Safe Harbor Agreement contemplates that cooperation by agencies and organizations in addition to the signatories and participating landowners will be necessary and desirable in ensuring comprehensive implementation of the Safe Harbor Agreement and long-term conservation of the Chiricahua leopard frog in the Malpai Borderlands area; and,

WHEREAS, other organizations or Federal or State agencies who are not signatories to the Safe Harbor Agreement may, nevertheless, have certain regulatory or land management authorities or responsibilities within or near the Malpai Borderlands area, or may themselves be engaged in Chiricahua leopard frog conservation efforts within or near the Malpai Borderlands area; and,

WHEREAS, such other agencies and organizations (including, but not limited, to the Arizona Game and Fish Department; New Mexico Department of Fish and Game; U.S. Forest Service; U.S. Bureau of Land Management; U.S. Geological Survey, Biological Resources Division; University of Arizona, Tucson; Douglas High School, Douglas, Arizona; and The Nature Conservancy) may elect or desire to become cooperators in the Safe Harbor Agreement's conservation program;

NOW, THEREFORE, the parties to this Agreement mutually agree and understand as follows:

I. Purpose

The purpose of this Cooperative Conservation Agreement for the Chiricahua Leopard Frog is to establish a general framework for cooperation among the parties to the Cooperative with respect to the Safe Harbor Agreement and for participation in the Safe Harbor Agreement's Chiricahua leopard frog conservation program by [enter name of agency or organization]. The parties to the Cooperative propose to work together to implement the Chiricahua leopard frog conservation program described in the Safe Harbor Agreement and generally to cooperate to establish and foster stable Chiricahua leopard frog populations in the Malpai Borderlands area.

II. Policies and Principles

This Cooperative recognizes the following policies and principles:

A. Participation in the Safe Harbor Agreement's Chiricahua leopard frog conservation program by any cooperator not a signatory to the Safe Harbor Agreement and entry into this Agreement by any such cooperator is entirely voluntary and is subject to the sole discretion of the cooperator. Entry into the Agreement by the Malpai and the Service is also voluntary and subject to their sole discretion.

B. Unless otherwise indicated, specific work projects or activities that involve the transfer of funds, services, or property among the parties to this Cooperative will require the execution of separate agreements or contracts contingent upon the availability of funds as appropriated by Congress, any applicable state legislature, or other funding entity, as applicable.

C. This Cooperative in no way restricts its parties from participating in similar activities or arrangements with other public or private agencies, organizations, or individuals, nor shall it obligate its parties to expend appropriations or enter into any contract or other obligations.

D. This Cooperative does not modify or supercede the existing statutory authority or direction of any party to the Cooperative.

E. This Cooperative may be modified or amended upon written request of any party hereto and the subsequent written concurrence of all the parties. Participation in this Cooperative by any party may be terminated with a 60-day written notice by that party to the other parties. Unless terminated under the terms of this paragraph, this Cooperative shall remain in full force and effect until the termination of the Safe Harbor Agreement as described in section 3.2.

III. Responsibilities of the Parties

The responsibilities of the parties to this Cooperative are as follows.

U.S. Fish and Wildlife Service. The Service shall perform all obligations and implement all measures assigned to it under the Safe Harbor Agreement, and shall perform the following additional obligations and measures as assigned to it under the terms of this Cooperative.

A. [Enter any additional Service obligations or responsibilities].

B. [Enter any additional Service obligations or responsibilities].

Malpai Borderlands Group. The Malpai shall perform all obligations and implement all measures as assigned to it under the Safe Harbor Agreement, and shall perform the following additional obligations and measures as assigned to it under the terms of this Cooperative.

A. [Enter any additional Malpai obligations or responsibilities].

B. [Enter any additional Malpai obligations or responsibilities].

[Enter name of agency or organization]. Under the terms of this Cooperative, [enter name of agency or organization] shall perform all activities as described in section 2.7 of the Safe Harbor Agreement (as described in measures A through C below), or as otherwise assigned to it under the terms of this Cooperative (as described in measures D and E below). [Enter name of agency or organization] shall, therefore:

A. Subject to request by the Malpai and the Service, serve on the Malpai Conservation Committee as described in section 2.5.8 of the Safe Harbor Agreement.

B. Subject to its discretion, provide in-kind services (e.g., staff time, as available) to support conservation activities under the Safe Harbor Agreement, including, but not limited to: (i) leopard frog management, reestablishment, and translocation activities; (ii) biological monitoring activities; and (iii) operation of leopard frog propagation facilities.

C. Provide funding for leopard frog conservation activities as described in the Safe Harbor Agreement as appropriate and available from programs administered by [enter name of agency or organization].

D. [Enter any additional obligations or responsibilities].

E. [Enter any additional obligations or responsibilities].

[The obligations and responsibilities for Safe Harbor Agreement program cooperators described in measures A through C above are as generally described in section 2.7 of the Safe Harbor Agreement. However, it is anticipated that the specific conservation measures and other obligations and responsibilities that individual cooperators may consent to under this Cooperative will be determined jointly by the Malpai, the Service, and cooperator during discussions concerning entry into the Cooperative by these parties. Therefore, the obligations and responsibilities of the Service, Malpai, and other Safe Harbor Agreement cooperators under this section of the Cooperative as described above should be revised and specified as appropriate.]

IN WITNESS WHEREOF, THE PARTIES HERETO have executed this Cooperative Agreement for Chiricahua Leopard Frog Conservation to be in effect as of the date last signed below.

BY_____ Date_____
Executive Director
Malpai Borderlands Group
Douglas, Arizona

Notarized _____

BY_____ Date_____
Regional Director
U.S. Fish and Wildlife Service
Albuquerque, New Mexico

Notarized _____

BY_____ Date_____
[Enter title of person signing]
[Enter name of agency or organization]
[Enter location of agency or organization]

Notarized _____

Appendix D

June 2002

***Rana chiricahuensis* - Fish and Wildlife Service/Arizona Game and Fish Department/New Mexico Department of Game and Fish Survey Protocol for Project Evaluation:**

Permits/Certification: Surveyors must be permitted by the Fish and Wildlife Service and the appropriate State agency. To obtain a permit, surveyors must attend Fish and Wildlife Service/State approved certification training.

Procedure: Surveys shall include a night visit to all suitable habitats (see definition in Attachment 1) in the projects action area (the area affected directly and indirectly by the action). This will typically involve walking stream and river banks, along the edges of wet meadows, and around the perimeters of stock tanks and lakes in the action area. Surveys shall be carried out with flashlights/headlamps, and a dip net shall be used to sample for tadpoles and frogs concealed in undercut banks or at the base of emergent vegetation. Watch for frogs on banklines, but also floating in the water or visible on the bottom, and in areas away from water - particularly during or after rains. Surveyors shall also listen for the distinctive call of the Chiricahua leopard frog and watch for egg masses. Audible plops may indicate frogs are present, but their identity to species must be confirmed. Plops preceded by an escape call (eeep) indicates bullfrog presence. Surveys shall be carried out from April through September, and when water temperatures are at least 12° C and winds are light or absent, which is when frogs are most active. A diurnal survey can substitute for a nocturnal survey, but if frogs are not detected, surveyors should return at night. In simple habitats, such as typical livestock tanks with little or no bankline and emergent cover, 2 diurnal surveys carried out 1-3 hours after sunrise can substitute for a nocturnal survey. If surveyors have valid State and Federal permits for collecting, and populations appear robust, a sample of up to 3 tadpoles should be collected as vouchers. Surveyors should note observations of fishes to species, if possible, bullfrogs, crayfish, salamanders, garter snakes to species, and other native frogs. Additional information on how to survey sites is contained in Attachment 1 (General Visual Encounter Survey Protocol- Arizona Game and Fish Department). Data should be recorded on standard field survey forms (Attachment 2), and data should be collected in accordance with the instructions for the form (Attachment 3).

Disease Prevention: To prevent inadvertent movement of disease or parasitic organisms among sites, surveys shall conform to the Declining Amphibians Population Task Force Fieldwork Code of Practice, with the exception that 10% bleach solution or quaternary ammonia (Quat 128) should be used to clean equipment rather than 70% ethanol. The latest version (April 2002) is included as Attachment 4; however, surveyors should periodically check the following website (www.npwrc.usgs.gov/narcam/techinfo/daptf.htm) for updates.

Survey Frequency: In simple habitats, such as stock tanks (not dry) with little or no bankline or emergent vegetation, a single nocturnal survey as described above will detect frogs, if they are present, over 90% of the time. Numbers of frogs detected are also likely a rough index of the relative abundance of frogs (Howland *et al.* 1997). In more complex sites, such as streams, rivers, and lakes with substantial vegetation or other cover, braided channels, or habitats that are difficult to access and survey, 2 or more surveys are warranted to accurately assess presence. As noted above, if diurnal rather than nocturnal surveys are conducted in simple systems such as typical livestock tanks with little or no bankline or emergent cover, at least 2 surveys should be conducted. Negative survey results, particularly in complex habitats, do not indicate with certainty the species is absent, but with repeated negative surveys, the likelihood of presence decreases.

Site occupancy often changes, particularly at stock tanks or other small, dynamic aquatic systems. Frogs may be extirpated due to drought, floods, disease, or other factors. Frogs can also immigrate to and

colonize a site anytime during the warmer months (however, dispersal and colonization is most likely to occur during the summer monsoons). If extant populations occur within dispersal distance[1] of a site under assessment supporting suitable habitat, colonization is likely to occur and surveys once a year or as part of project planning or BA/E preparation are warranted to assess presence/absence. Isolated, small populations are subject to extirpation and also warrant more frequent surveys to assess current status. Larger populations in natural systems are less likely to be extirpated, and as a result, survey results and assessments of presence are valid for a longer period of time. Similarly, larger sites that are unoccupied due to presence of nonnative predators are unlikely to be occupied in the foreseeable future and do not warrant frequent surveys.

[1]Reasonable dispersal distance includes the following distances from occupied habitat to sites being evaluated for occupancy: a) within 1 mile overland, b) within 3 miles along an ephemeral or intermittent drainage, or c) within 5 miles along a perennial stream.

Literature Cited

Howland, J.M., M.J. Sredl, and J.E. Wallace. 1997. Validation of visual encounter surveys. Pages 27-44 in M.J. Sredl (ed). Ranid frog conservation and management. Arizona Game and Fish Department, Nongame and Endangered Wildlife Program, Technical Report 121.

Ranid tadpoles can be identified using:

Scott, N.J., and R.D. Jennings. 1985. The tadpoles of five species of New Mexican leopard frogs. The Museum of Southwestern Biology, Occasional Papers 3:1-21

Degenhardt, W.G., C.W. Painter, and A.H. Price. 1996. Amphibians and reptiles of New Mexico. University of New Mexico Press, Albuquerque. (See key by R. Altig at pages 15-16, and species accounts).

Recordings of the calls of Southwestern anurans, including the Chiricahua leopard frog, are found in:

Davidson, C. 1996. Frog and toad calls of the Rocky Mountains. Library of Natural Sounds, Cornell Laboratory of Ornithology, Ithaca, NY.

To identify Southwestern ranids and other anurans, see:

Degenhardt, W.G., C.W. Painter, and A.H. Price. 1996. Amphibians and reptiles of New Mexico. University of New Mexico Press, Albuquerque. (Especially see page 79, comparison of Southwestern leopard frogs).

Appendix D, Attachment 1
General Visual Encounter Survey Protocol
(Arizona Game and Fish Department, May 2002)

This standard visual encounter survey (VES) protocol is to be used for Chiricahua leopard frog surveys. This protocol was adopted from Heyer *et al*. (1994) and modified based on statewide ranid surveys in Arizona. The protocol is designed to be simple and repeatable with minimal training of personnel. However, all personnel should be trained and have survey technique checked periodically by a more experienced individual. The VES protocol described here will generate presence/absence data if used independently and generate information from which inferences about abundance and trends can be made if used in a statistically valid monitoring program. Before designing a monitoring program, it is recommended that the user consult Gibbs' (1996) program MONITOR or Gerodette's (1987, 1993) program TRENDS to test the statistical power of the proposed monitoring program.

Equipment needed:

The observer should always have the following when conducting a VES:

- a dip net
- a Global Positioning System unit set to read in the North American Datum 1927 (NAD27Conus) and the appropriate Universal Transverse Mercator (UTM) Zone
- a clipboard with the Chiricahua leopard frog Survey Form and instructions
- a pen with waterproof ink
- a time piece with a stop watch
- a pH meter
- 2 thermometers
- a conductivity meter
- a sling psychrometer or hygrometer
- binoculars
- the appropriate United States Geologic Survey quadrangles
- bleach or Quat128 for disinfecting all gear before and after surveying each site

Other suggested items are the following:

- a counter or clicker for keeping a tally of frogs observed
- a field notebook
- a headlamp or spotlight for night surveys
- rubber boots, hip waders, or chest waders depending on the habitat
- guides to identification of aquatic insects, fish, amphibian larvae, and adult amphibians
- a camera with slide film
- the appropriate land ownership maps
- database reports of historic surveys done in the area
- wind meter
- measuring tape
- "dead box" (whirl pack or ziplock bags, MS 222, and formalin for collecting specimens)
- pocket magnifier (to help identify tadpoles, look at mouthparts, etc.)
- tape player (for call backs and identifying calls)
- taped recordings of anuran calls (e.g. Davidson 1996)
- compass

Survey Protocol:
All "suitable" habitats within an action area (area to be affected by a project) should be surveyed.

Suitable Habitat is defined as follows: The frog is a habitat generalist that is found in cienegas, pools, beaver ponds, livestock tanks, lakes, reservoirs, streams, and rivers at elevations of 1,000 to 2,710 meters (m). They are occasionally found in livestock drinkers, irrigation sloughs and acequias, wells, abandoned swimming pools, back yard ponds, and mine adits. On the Coronado National Forest, the species occurs from 1,000 to 2,013 m. On the other Forests in Arizona, Chiricahua leopard frogs occur between 1,080 and 2,525 m. The frog uses permanent or nearly permanent pools and ponds for breeding. Most sites that support populations of this frog will hold water year long in most years. Time from hatching to metamorphosis is shorter in warm waters than cold water, thus water permanency is probably more important at higher elevation and in the northern portion of the species' range. The species is rarely found in aquatic sites inhabited by nonnative fish, bullfrogs, or crayfish. However, in complex systems or large aquatic sites, Chiricahua leopard frog may occur with low densities of nonnative predators.

Surveys in suitable lentic and lotic systems should be conducted as follows:

Lentic systems: Upon approaching a survey site, stop approximately 20 m from the bank and search the site with binoculars. Search for frogs floating in water away from the bank as well as scanning the bank as best as possible. Walk around the entire perimeter of the site. If the entire perimeter is not surveyed, record the start and stop points as UTM coordinates. While walking along banks, use a dip net to sweep vegetation to flush frogs that do not respond to the observer's approach. After the initial perimeter survey, search mud cracks, divots, under rocks and downed branches, and any other places where frogs might find cover. If the lentic system allows, walk though the site in a zigzag fashion to further flush frogs that may be sitting on the bottom of the water. Dip net to determine the presence of amphibian larvae, fish, and aquatic insects. Record all visual observations and audible "plops" of frogs escaping into water. Be careful not to count frogs more than once.

Lotic systems: Upon arriving at the starting point of a lotic system, record the starting point (or the most downstream point of the site) as UTM coordinates. Proceed upstream searching the banks, surrounding vegetation, and water along a minimum of 400 m of a lotic system. Search under rocks, downed branches, undercut banks, and any other places where frogs might find cover as best as possible. Where the lotic system allows, walk though the site in a zigzag fashion to further flush frogs that may be sitting on the bottom of the water. Dip net to determine the presence of amphibian larvae, fish, and aquatic insects. Record all visual observations and audible "plops" of frogs escaping into water. Be careful not to count frogs more than once.

Data collection: Data should be collected according to the Chiricahua Leopard Frog Survey Form Instructions (Attachment 3). Collect the following data at the specified locations, but note any major changes that occurred during the survey on the data form. Record the site name, UTM points, elevation, USGS quad, date, observers, and time the survey starts at the starting point of the survey. Record time the survey stops, time spent actively searching for herps, effort, any voucher specimens taken, water class, water type, search methods, water pH, relative humidity, air and water temperature, habitat characteristics (water clarity, vegetation types present, primary substrate, site width and/or length), weather conditions (wind, cloud cover, precipitation), land use, sign of potential vertebrate and invertebrate predators, as well as comments at the end point of the survey. Record any herps observations.

New Site: Y N Attachment 2: CHIRICAHUA LEOPARD FROG SURVEY FORM 6/02

DATE: MM DD YYYY	DRY TANK: Y	START TIME:	STOP TIME:	SEARCH TIME: MIN	OBSERVERS:

*SITE NAME:	SITE AT:

NUM:___---____	*UTM ZONE: 11 12 13	EASTING	NORTHING	ELEVATION m

QUAD:	Quad MIN: 7.5 15	Quad YEAR:	COUNTY:_ _---_ _ _ _ _

DIRECTIONS:

SITE AND VISIT CONDITIONS

EFFORT: (METERS)

Total Perimeter	Partial Permitier	Left Bank	Right Bank	Both Banks

VOUCHERS: SPECIMEN PHOTO: _ _ HABITAT PHOTO: _ _

SPECIMEN(S): Y N SPECIMEN #'S:

*H_2O CLASS: LENTIC (POND) LOTIC (STREAM)

H_2O TYPE: Riverine Wetland Stock Tank Lake Reservoir Metal/concrete drinkers Canal Plant Outflow Dry Tank

*SEARCH METHODS: Dip Net Seine Trap Hand Exploration Boat Call Playback Other Visual

pH: TDS/CONDUCTIVITY:

T_{AIR}: ºC / ºF T_{WATER}: ºC / ºF WATER CLARITY: Very Clear 1 2 3 4 5 Turbid

LENTIC LENGTH: m LENTIC WIDTH: m LOTIC WIDTH: m RIPARIAN WIDTH: m

PRIMARY SUBSTRATE (mark 1-3): Mud/silt Sand Gravel Cobble Boulder Bedrock

WIND: 0 1-5 6-10 11-15 16-20 >20 mph

PRECIPITATION: None Intermittent Steady & Light Steady & Heavy Snow/Sleet

CLOUD COVER: clear partly cloudy mostly cloudy overcast

VEGETATION	%	PROMINENT SPECIES
FLOATING		
SUBMERGED		
EMERGENT		
PERIMETER		
CANOPY		

PREDATORS: (include scat and tracks) Leeches Boatmen/Backswimmers Dragonflies Belostomatids Water Beetles Warm water fish Cold water fish Tiger salamanders Bullfrogs Mud turtles Gatersnakes Wading birds Hawks (black or zone-tailed) Mammals Crayfish

*OTHER ORGANISMS:

OTHER ORG. NOTES:

SITE/SURVEY NOTES:

HERPETOFAUNAL OBSERVATIONS

SPECIES	CERTAINTY	LIFE STAGE	# OBSERVED	NOTES
	Uncertain Certain	Egg Larvae Juv. Adult		
	Uncertain Certain	Egg Larvae Juv. Adult		
	Uncertain Certain	Egg Larvae Juv. Adult		
	Uncertain Certain	Egg Larvae Juv. Adult		
	Uncertain Certain	Egg Larvae Juv. Adult		
	Uncertain Certain	Egg Larvae Juv. Adult		
	Uncertain Certain	Egg Larvae Juv. Adult		
	Uncertain Certain	Egg Larvae Juv. Adult		

COMMENTS:

More on back: Y N

Appendix D, Attachment 3
CHIRICAHUA LEOPARD FROG SURVEY FORM INSTRUCTIONS (May 2002)
Adapted from Riparian Herp Survey Form Instructions (Blomquist, Field, and Sredl) by B. Christman

- All fields are to be completed for historical sites and sites with target riparian species.
- Fields with an asterisk (*) are to be completed for every survey, regardless of results.
- If the site has not been previously surveyed to your knowledge, circle Y (yes) at the top of the form, otherwise circle N (no) and check the Locality Data in the Chiricahua Leopard Frog Database for accuracy.
- Check each Survey Form for completeness and clarity prior to sending to State Game and Fish Department and U.S. Fish and Wildlife Service for archiving.

Locality Data:

*DATE: Record the date of the survey as eight numbers giving the month first, followed by the day then the year (e.g., 10-27-1993, 06-02-1994).

*START TIME: Record the time the surveyor begins searching for frogs using a 24-hour clock.

*STOP TIME: Record the time the surveyor stops searching for frogs using a 24-hour clock.

*SEARCH TIME: Record the time spent actively searching for herps in minutes. The time recorded should include only time spent actively searching for herps and should not include time taken to write field notes, complete data sheets, read data sheet instructions, or other activities that may be performed while at the site.

*OBSERVERS: List the names of all people present during the survey. Record the names as: first initial, second initial, and full last name (e.g., C. W. Painter).

*SITE NAME: A "site" is any aquatic system (or portion of an aquatic system) that is > 1 mile from any other survey locality, or if less than 1 mile apart, represents a **distinct** change in aquatic habitat types (e.g., riverine vs. lake or cienega). Features with unique names are considered unique sites regardless of how far apart they are. Record the site name as it is marked on the United States Geologic Survey (USGS) quadrangle (hereafter quadrangle or quad). If the site is unnamed on the quad, refer to the corresponding land management map (e.g., U.S. Forest Service map, BLM Surface Management Responsibility map). If the site doesn't have a name, write "unnamed" preceding the feature; similarly, if the site is not marked on any map, write "unmarked" preceding the feature (e.g., Unnamed Wash, Unmarked Tank).

SITE AT: This field should always be filled out for unnamed and unmarked sites and for large/long aquatic systems. For other localities, use this field *as needed* to enhance a site name (i.e., to verbally pin-point a site in space). Use such features as the nearest road crossing (e.g., San Francisco River at Alma bridge) stream confluence (e.g., East Fork Gila River at **Diamond Creek**) or topographic feature (e.g., San Francisco River **W of Glenwood**) in the description.

*NUM: A site number is a unique number that, once assigned to a site, will always be used in conjunction with that site. Using the first two or three letters of the county and number in an ascending order, or use National Forest, BLM, Tribal, or other abbreviations for the area where the data are collected.

*UTM ZONE: Circle “11”, "12" or "13" to note whether the **starting point** of the survey is in UTM grid zone 11 (west of 114 degrees longitude), 12 (east of 144 degrees and west of 108 degrees longitude) or 13 (east of 108 degrees longitude). Most of New Mexico, except for the extreme western portion, is in Zone 13. Most of Arizona is in Zone 12.

*EASTING: Record the **starting point** of the survey as a 6-digit number. An example of a UTM x-coordinate is 295440E. Use a Global Positioning System (GPS) unit to measure the UTM coordinate. The UTM coordinate should be measured in North American Datum 1927 (NAD27Conus for Garmin units). Check that the GPS unit is set to the appropriate Zone. Alternatively, read the UTM coordinate from the quad. The first 3 numbers will be found on the top or bottom edge of the quad. These numbers are in 100,000-meter increments. The fourth number describes a point with 100-meters accuracy. The fifth number describes a point with 10-meters accuracy. The last number will be a zero. Use a coordinate scale to determine the fourth and fifth numbers.

*NORTHING: Record the **starting point** of the survey as a 7-digit number. An example of a UTM y-coordinate is 4318410N. Use a Global Positioning System (GPS) unit to measure the UTM coordinate. The UTM coordinate should be measured in North American Datum 1927 (NAD27). Check that the GPS unit is set to the appropriate Zone (most of New Mexico is Zone 13). Alternatively, read the UTM coordinate from the quad. The first 4 numbers will be found along the left or right edge of the quad. These numbers are in 1,000,000-meter increments that tell you how far north of the equator you are. The fifth number describes a point with 100-meter accuracy. The sixth number describes a point with 10-meter accuracy. The last number will be a zero. Use a coordinate scale to determine the fifth and sixth numbers.

*ELEVATION: Record the elevation at which the **starting point** of the survey occurs. Read the elevation off of the survey quad. Be sure to indicate the elevation in meters (m) or feet (ft.). The contour interval and unit (meters or feet) is written in the center of the bottom margin of the quadrangle. To convert feet to meters multiply by 0.3048.

*QUAD(S): Record the quadrangle name as it appears on the quadrangle except in the situations outlined below. The name of the quadrangle appears in the upper and lower right hand corners of the quadrangle. If more than one quad is used in the survey, record the name of the quad in which the survey starts and note the name(s) of the other quad(s).

- Change the word "Mountain" to "Mtn" if it appears anywhere in the quad name other than the first word.
- Composite polar coordinates (e.g., Southeast, Northwest) should be abbreviated (e.g., SE, NW) if they appear anywhere in the quad name other than the first word
- Never abbreviate the four cardinal directions

*MIN: Circle "7.5" or "15" to note whether the quadrangle series is 7.5 or 15 minutes. The series of the quadrangle can be found in the upper right hand corner of the quadrangle.

*Quad YEAR: Record the year of the quadrangle as it is printed in the lower right corner of the quadrangle. If more than one year appears on the map, record the year of the most recent revision.

*COUNTY: Record the state abbreviation (e.g., NM) followed by a hyphen and then the first 4 letters of the county (e.g., NM-CATR, NM-SIER). The county name can be found in the upper right corner of the quadrangle if the quad covers an area within a single county. For quads that cover areas in two or more counties, the names of the counties will appear somewhere in the topographic region of the quad. National Forest maps and Highway road maps, and the Atlas & Gazetteers are also useful in identifying counties.

DIRECTIONS: Write the directions to the site. **Keep them short and pertinent** (e.g., on FS 105 ~4.3 MI N of FS 105/FS 393 jct.). Directions are especially important when there are no roads or when existing roads are not marked on your maps. Use the directions N, NE, E, SE, S, SW, W, and NW instead of "turn right" or "veer left". This field can also contain any information or comments you want to convey to other field personnel. For example: "Dry 05/1994"; "Contact landowner for permission to access, also survey adjacent tank and draw"; etc.

Site and Visit Conditions:

*EFFORT: There are 5 categories of effort:

TP = Total Perimeter
PP = Partial Perimeter
LB = Left Bank
RB = Right Bank
BB = Both Banks

Circle all category(s) that apply. For all categories other than TP, record the distance surveyed in meters. The minimum acceptable survey distance for linear systems and large lentic systems (> 20 acres) is 400m (0.25 mile). Use category BB for any lotic system in which it is possible for you to access both banks (i.e., to meander from shore to shore). Use categories LB and RB for large, deep, and/or swiftly flowing lotic systems in which you are unable to meander shore to shore. LB and RB should always be filled out together even if you didn't survey, or were unable to access, one of the shores (e.g., LB = 0000m, RB = 0350m; RB = 0050m, LB = 0200m). Left and right banks are in reference to a person looking upstream. To calculate meters walked use a map wheel, range finder, or measuring tape. If using a map wheel to determine the distance in kilometers (or miles), be sure to use the scale on the map wheel that corresponds to the scale of your map or quad. Multiply your result by 1000 to get meters. Round the final result to the nearest 25-meter value. Alternatively, multiply the value generated from the map wheel in miles by 5,280 feet/mile. Multiply this new value by 0.3048 meters/foot. Remember, during the course of any survey, the surveyor

should dip net, comb through bushes and grasses, turn over rocks, and scan the water and shore for herpetofauna.

*VOUCHERS: Note how many photo vouchers of specimens were taken at a site. Write the number as 2 digits (e.g., 00 or 13). Photo vouchers of specimens should be close-ups (i.e., macro shots) of diagnostic characters (e.g., thigh pattern and dorsolateral folds of leopard frogs, scale row of lateral stripes in garter snakes, dorsal and cranial views of toads). Note how many habitat photographs were taken at a site. Write the number as 2 digits (e.g., 00 or 02). Habitat photos should be taken at any site in which target riparian herps were found, at any historical locality regardless of results, and at any survey site that has suitable habitat even if no target riparian herps were found. Keep a detailed log of all photos taken with the camera. Circle "Y" (yes) or "N" (no) as an indication of whether voucher specimens were collected at a site. If "Y" is circled, the collection tag number(s) should be written in the Specimen #s field. In New Mexico, all specimens collected should be given to the New Mexico Dept. of Game and Fish, Endangered Species Program for identification and deposition in the Museum of SW Biology at Univ. of New Mexico. Vouchers collected in Arizona should be provided to Arizona Game and Fish Department, Nongame Branch, Phoenix.

*H_2OCLASS: Circle 1 category that best describes the hydrological class of the water system you have surveyed.

Lentic = still water
Lotic = flowing water

*H_2OTYPE: Circle 1 category that best describes the type of water you have surveyed. The categories are based upon lotic/lentic characteristics as well as the size/magnitude of the water body:

Riverine = natural flow, from raging rivers to streams to seeps
Wetland = an inland body of water that is primarily emergent vegetation (e.g., cienega)
Stock tank = an earthen-dammed or dredged basin that catches run-off for livestock or wildlife
Lake = an inland body of water that is primarily open water
Reservoir = a dammed riverine system that is primarily used for recreation and/or human water supply
Metal/concrete tanks and drinkers = manmade water holding structures
Canal = manmade (metal, concrete or earthen) diversion or drainage ditch.
Plant outflow = sewage and electric plants; any chemical or mechanical processing of water; storm drainages
Dry Tank = a stock tank that is dry

*SEARCH METHODS: Circle all methods used to search for herps. If needed, include a description of other techniques used to search in the SITE / SURVEY NOTES with a footnote reference. Remember, during the course of any survey, the surveyor should dip net, comb through bushes and grasses, turn over rocks, and scan the water and shore for herpetofauna.

pH: Measure pH using a pH meter. The water sample should be taken from water column 1 meter from shore. For bodies of water less than 2 meters wide, take the sample from the center. Be sure to: 1) take the cap off the meter before using, 2) keep the level of the water sample below the mark on the meter, 3) turn the meter on before measuring the pH of the sample, and 4) turn the meter off when finished sampling. Meters should be calibrated monthly.

TDS/ CONDUCTIVITY: Total Dissolved Solids should be measured using a TDS meter, following instructions for pH.

*T_{AIR}: Measure air temperature to the nearest 10^{th} of a degree (degrees Celsius) 1.5 meters above ground and 1.5 meters from the water. Be sure thermometer is shaded and completely dry.

*T_{WATER}: Measure water temperature to the nearest degree (degrees Celsius) 1 centimeter below water's surface and 1 meter from shore. For bodies of water less than 2 meters wide, measure temperature at the center. Be sure to shade the thermometer.

WATER CLARITY: Circle 1 clarity category that best describes the survey area.

*LENTIC LENGTH: For lentic systems, record the length (i.e., longest axis) of the system in meters. Measure the entire system (not just the portion surveyed), and use the standing water at the time of the survey as your boundaries. Do not measure the normal waterline or highwater mark. For large systems, estimate the length using a map. Do not rely on a visual estimate for large systems.

*LENTIC WIDTH: For lentic systems, record the width (i.e., shortest axis) of the system in meters. The width should be the maximum distance perpendicular to the length axis. As with the length, the width should reference the entire lentic system, not just the portion surveyed, and should be determined based upon the standing water present at the time of the survey, not the usual waterline or high water mark. Use a map as a guide for larger systems.

*LOTIC WIDTH: For lotic systems, select one range that best describes the width of water at the time of the survey. Do not measure the normal waterline or the high water mark. When the width category is in doubt, round up.

*RIPARIAN WIDTH: Record the maximum width of the riparian area in meters. Riparian width should be measured from the boundary of riparian vegetation and upland vegetation. For a lentic system, include the area of riparian vegetation along the shore of the body of water and any vegetated waters. For a small lotic system in which both banks can be surveyed simultaneously, include the zone of riparian vegetation on both banks of the body of water surveyed and any vegetated waters. For large or swiftly flowing lotic systems, include only bank that was surveyed or the mean width of riparian vegetation on both banks. Riparian width is measured for the area surveyed.

*PRIMARY SUBSTRATE: Circle from 1 to 3 categories as appropriate. All substrate types may be present, but choose only those that best describe the area potentially inhabited by target species.

Mud/Silt = 0.001-0.1 mm
Sand = 0.1-2 mm
Gravel = 2-32 mm
Cobble = 32-256 mm
Boulder >256 mm
Bedrock = exposed sheet of rock

*WIND: Circle 1 category as appropriate. Wind should be measured 1.5 meters above the ground and 1.5 meters from the water. If using a wind meter, be sure to: 1) hold meter near the top so that you are not blocking any holes, 2) face into the direction of the wind while reading the meter, and 3) use the left scale for wind strengths < 10 mph, and use the right scale (by putting your index finger over the red knob on top of the meter) for wind strengths ≥10 mph. Wind speed can be estimated with the Beaufort scale:

≤1 mph = smoke rises vertically
1-3 mph = wind direction shown by smoke drift
4-7 mph = wind felt on face, leaves rustle
8-12 mph = leaves and small twigs in constant motion, wind extends light flag
13-18 mph = raises dust and loose paper, small branches are moved
19-24 mph = small trees begin to sway, crested wavelets form on inland waters
>24 mph = greater effect than above

*PRECIPITATION: Circle 1 category as appropriate.

*CLOUD COVER: Circle 1 category as appropriate. Categories are based on percent cover.

VEGETATION % & PROMINENT SPECIES: Record the percent of the area potentially inhabited by target species that is covered by floating vegetation (e.g., broad-leafed macrophytes and dense algal mats), submerged vegetation, emergent vegetation (e.g., cattails, sedges, rushes), perimeter vegetation (i.e., up to 1 m from waters edge), and canopy vegetation. Use increments of 5% (i.e., 1% effectively = 0). Record the genus name or common name (only if positively identified) of the 1-4 most prominent species that best describe the surveyed area.

*PREDATORS: Circle all predators seen or otherwise detected at a survey site. Most predator categories lump together similar organisms and/or organisms with similar effects on riparian herps. Record herp predators in the Herpetofauna Observations table. For **crayfish**, include claws and carapaces as evidence of presence. For **dragonflies**, do not include damselflies. For **beetles**, include any large aquatic beetles observed, such as hydrophilids and dytiscids. **Warm water fish** include bass, carp, catfish, perch, sunfish, and walleye. **Cold water fish** include trout and pike. **Large wading birds** include American bittern, black-crowned night heron, egrets, great blue heron, and green-backed night heron. **Mammals** include only medium-sized mammals such as skunk, ring-tail, and raccoon.

*OTHER ORGANISMS: This field is to be used for observations of species other than riparian herpetofauna. Riparian herps are to be recorded in the "Herpetofauna Observations" table. List all non-riparian herps by 4-letter genus/species code or write out common or scientific

name. List federal or state sensitive species of other organismal groups or any other species whose occurrence merits noting by common name. No words other than the species name(s) should be listed (e.g., great horned owl, elk). Use the OTHER ORG. NOTES field as needed to expand upon why you listed a species.

OTHER ORG. NOTES: Use this field to write out noteworthy observations about any or all of the species listed in OTHER ORGANISMS (e.g., great horned owl roost site observed, area heavily impacted by elk grazing).

SITE / SURVEY NOTES: Use this field to describe the most outstanding features of a survey or site. **Don't be redundant** with fields already completed. Write short, specific comments that emphasize habitat quality and why you think you did or did not find herps. Be sure to comment on any land use in, around, or in proximity of the survey area that may potentially impact the study site (e.g., large mining operation 0.5 mile upstream of survey site, agricultural spraying 1 mile from survey site). You can also use this field to describe any noteworthy similarities or dissimilarities between the area searched and the total area (e.g., wash devoid of vegetation except in area of survey, survey covered the north end of the lake which was the only area with emergent vegetation).

Herpetofauna Observations:

*SPECIES: Record all riparian herp species (target or non-target) detected during a survey in this column. Record non-riparian herpetofauna in the OTHER ORGANISMS and OTHER ORG. NOTES. If no species are observed, record “NONE.” Use the unique 4-letter Genus-species code or write out common or scientific name. for all riparian herp species. When an organism cannot be identified to species (e.g., "I saw a ranid-like frog", or "I saw an anuran egg mass"), use the 4-letter code corresponding to the taxonomic classification for which you are confident in your identification. For the examples above, the ranid-like frog would be assigned the code "RANA", and the egg mass would be coded as "ANUR". If you are confident you saw a leopard frog but are not certain which species you saw, use the code "RAPC." **Do not use historic information to bias your decision on species identification**. Record your most confident observation and justify it in the NOTES or COMMENTS.

CERTAINTY: Circle 1 word to indicate your level of certainty about your identification of each species. Certainty of identification should be based on species-specific diagnostic characters (e.g., thigh pattern and dorsolateral folds in leopard frogs, scale row of lateral stripes in garter snakes, lack of dorsal stripe and cranial crests in New Mexico toads). For information on diagnostic characters of species, see the references listed in the survey protocol.

LIFE STAGE: Circle the life stage of each species observed. Use separate rows for different life stages of the same species. A juvenile leopard frog is usually < 55 mm SVL, while an adult is > 55 mm SVL or exhibits obvious sign of breeding condition (e.g., swollen thumbpads, stretched vocal sacs)

OBSERVED: Enter the number of individuals of each species and life stage you encountered. Do not estimate total numbers within the survey area, but record only the number that you saw. For egg masses, estimate the number of eggs, note the overall size of mass,

condition, and stage of embryos in the NOTES or COMMENTS sections (see Gosner 1960).

NOTES: Record any relevant notes specific to the species or life stage observed. Types of observations to include are as follows: 1) what criteria were used to identify a species; 2) if species identification is uncertain, what was observed including both physical features and behaviors would be of use (e.g., "dorsal spots obs.," "ranid like plop," "no bullfrog peep"); 3) record the collection number (field tag #) of any voucher specimens taken; 4) record any photo vouchers taken; and 5) note the presence of disease or deformities.

COMMENTS: Use this field to elaborate upon species. Be sure to reference your comments with the species observation to which it relates by using numbers or letters (i.e., a footnote).

Appendix D, Attachment 4
Code of Practice

Prepared by the Declining Amphibian Populations Task Force (DAPTF) to provide guidelines for use by anyone conducting fieldwork at amphibian breeding sites or in other aquatic habitats (we have made minor modifications to reflect new information).

Observations of diseased and parasite-infected amphibians are now being frequently reported from sites all over the world. This has given rise to concerns that releasing amphibians following a period of captivity, during which time they can pick up in apparent infections of novel disease agents, may cause an increased risk of mortality in wild populations.

Amphibian pathogens and parasites can also be carried in a variety of ways between habitats on the hands, footwear, or equipment of fieldworkers, which can spread them to novel localities containing species which have had little or no prior contact with such pathogens or parasites. Such occurrences may be implicated in some instances where amphibian populations have declined. Therefore, it is vitally important for those involved in amphibian research (and other types of wetland/pond studies including those on fish, invertebrates, and plants) to take steps to minimize the spread of disease agents and parasites between study sites.

The DAPTF Fieldwork Code of Practice

1. Remove mud, snails, algae, and other debris from nets, traps, boots, vehicle lyres, and all other surfaces. Rinse cleaned items with sterilized (eg. boiled or treated) water before leaving each study site.

2. Boots, nets, traps etc. should then be **allowed to dry completely or shall be** scrubbed with **10% bleach or 1% quaternary ammonia (such as Quat 128)** solution and rinsed clean with sterilized water between study sites. Avoid cleaning equipment in the immediate vicinity of a pond or wetland.

3. In remote locations, clean all equipment as described above upon return to the lab or "base camp". Elsewhere, when washing-machine facilities are available, remove nets from poles and wash with bleach on a "delicates" cycle, contained in a protective mesh laundry bag.

4. When working at sites with known or suspected disease problems, or when sampling populations of rare or isolated species, wear disposable gloves and change them between handling each animal. Dedicate sets of nets, boots, traps and other equipment to each site being visited. Clean and store them separately at the end of each field day.

5. When amphibians are collected, ensure the separation of animals from different sites and take great care to avoid indirect contact between them (e.g. via handling, reuse of containers) or with other captive animals. Isolation from unsterilized plants or soils which have been taken from other sites is also essential. Always use disinfected/disposable husbandry equipment.

6. Examine collected amphibians for the presence of diseases and parasites soon after capture. Prior to their release or the release of any progeny, amphibians should be quarantined for a period and thoroughly- screened for the presence of any potential disease agents.

7. Used cleaning materials (liquids etc.) should be disposed of safely and if necessary taken back to the lab for proper disposal. Used disposable gloves should be retained for safe disposal in sealed bags.

The DAPTF Fieldwork Code of Practice has been produced by the DAPTF with valuable assistance from Begofia Arano, Andrew Cunningham, Tom Langton, Jarnie Reaser and Stan Sessions.

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Appendix E

Chronology the efforts on the Magoffin Ranch to maintain Rana chiricahuensis in Rosewood, Headquarters and Bellency tanks.

This summary of the Magoffin family's efforts to maintain Rana chiricahuensis in Rosewood Tank, Headquarters tank and Bellency tank is based upon published accounts, agency reports and Magoffin family records.

Rosewood Tank

1993: Rescue tadpoles from two drying pools and move to San Bernardino NWR
Surveys were conducted to monitor population.

1994: Small pool excavated in July prior to drying of tank, filled with well water, and tadpoles from the drying tank were placed in the pool.
Approximately 1000 gallons of water/week hauled to the pool to maintain refugium for the tadpoles. Tank dries completely leaving only the excavate pool as habitat. (Until this year Rosewood tank had never dried out in approximately 25 years.)
Refurbishing of Rosewood Tank begins.
Establish frogs at five Douglas School District Ponds and sites on the San Bernardino NWR
Surveys were conducted to monitor population.

1995: Continued water hauling as necessary all year, usually 1,000 gallons per week.
Refurbishing of tank is completed with tank deepened with a sediment trap and a new overflow system.
Surveys were conducted to monitor population.

1996: Continued water hauling as necessary until July, when rainfall filled tank for first time in 2 years.
Well was drilled to provide more reliable water, but first well was dry.
Second well was drilled in October, and windmill and concrete drought-refugium pond was installed for frogs, with assistance from AZ Game and Fish Department stewardship grant.
Surveys were conducted to monitor population.

1997: Pipeline installed from well to concrete pond to supply water.
AZ Game and Fish Dept. conducted water quality testing.
Frog egg masses moved to Douglas High School pond.
Surveys were conducted to monitor population.

1998: Generator driven electric pump installed on well.
Surveys were conducted to monitor population.

1999 to 2003: Pump was run weekly to maintain water in concrete pond and pond surveyed for frogs weekly.

2003: Sediment trap filled by rainfall in August. At least three egg masses observed in September, but pond was drying so tadpoles were moved into concrete pond.

Headquarters Tank

1997: A 10-meter diameter pond was completed which is fed by the house well.
Tadpoles released from Douglas High School facility (DHS).
Surveys were conducted to monitor established population.

1998: Surveys were conducted to monitor established population.
Additional tadpoles and metamorphs added to the tank in June.

1999 to 2002: The tank filled in with cattails and no frogs observed.

2003: Bullfrogs heard in tank. Chiricahua frogs have not been seen in several years and are assumed to be absent.

Bellency Tank

1995: Numerous Chiricahua frogs observed in tank.
Tank was drying, so well was drilled and windmill installed with assistance from Malpai Borderlands Group.

1996: Surveys were conducted periodically.

1997: Tadpoles were released from Rosewood Tank to augment population.

1998: Some adult frogs showed symptoms of Red-leg Disease, and population appeared to be declining.

1999 to 2002: No frogs were seen in the tank.

2003: Four adult frogs seen.
Pump was operated from mid-May through July to maintain water level, until rainfall filled tank.

The most complete account of these efforts from 1993-1997 can be found in Rosen and Schwalbe (1998). The conservation efforts from 1998 to present are from the Magoffin family records. Other articles and publications where some of these efforts are documented are listed below.

Published sources:

Cash, K. 1995. Sightings: Get Along Little Froggy. Nature Conservancy Magazine. March/April 1995.

Ikenson, B. 2002. A Harbor in the Desert. Birdscapes. U.S. Fish and Wildlife Service, Division of Bird Habitat Conservation. Spring-Summer 2002: 18-19.

Rosen, Philip C. and Cecil R. Schwalbe. 1998. Using Managed Waters for Conservation of Threatened Frogs. pgs 180-202. in Proceedings of Environmental, Economic, and Legal Issues Related to Rangeland Water Developments Symposium. November 13-15, 1997. Arizona State University College of Law, Tempe, Arizona.